ETC.

A REVIEW OF GENERAL SEMANTICS

WHAT IS MEANT BY ARISTOTELIAN
STRUCTURE OF LANGUAGE?
S. I. Hayakawa

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VOL. V, No. 4 SUMMER, 1948

ETC.:

A REVIEW OF GENERAL SEMANTICS

WHAT IS MEANT BY ARISTOTELIAN STRUCTURE OF LANGUAGE?*

S. I. HAYAKAWA

MY PURPOSE in this paper will be to explain briefly what I understand to be Korzybski's position on the subject of the relationship between language structure and 'thought,' between language structure and behavior. The existence of such a relationship is, as he says, 'not obvious,' even to intelligent and reasonably well-informed persons.[1]

To linguistic scholars, however, this relationship has been well-known for a long time. For example, Whorf says:

> We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare us in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds—and this means by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way—an agreement that holds throughout our speech community and is codified in the patterns of language. The agreement is, of course, an implicit and unstated one, *but its terms are absolutely obligatory;* we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees.[2]

The consequences of linguistic facts such as these have been but imperfectly investigated, at least by the linguistic profession. We are all familiar by now with the fact that the relativity theory, the new quantum mechanics, modern mathematics, etc., have revised not merely our notions of the world but have revised the

* Presented before Section H (Anthropology) of the American Association for the Advancement of Science, session of 'Linguistics and Culture,' Sherman Hotel, Chicago, December 27, 1947. Also presented before the University of Chicago Chapter of the Society for General Semantics, Kent Hall, University of Chicago, April 8, 1948.

[1] A. Korzybski, *Science and Sanity* (1933), p. 505. Since this work is quoted frequently in this paper, subsequent quotations will be identified simply by page numbers given in parentheses at the end of the quotation.

[2] Benjamin Lee Whorf, 'Science and Linguistics,' in Hayakawa's *Language in Action* (1941), pp. 311-313.

background structural assumptions upon which traditional beliefs had been built. The traditional agreements to which we had subscribed in the 'organization and classification of data,' the structure unconsciously ascribed to the world by traditional language habits, had proved hopelessly inadequate for modern scientific purposes. New languages were therefore developed, involving new structural assumptions.[3]

It is a habit among the linguistically uninformed to objectify language as something 'out there' which can be looked at independently of speakers or hearers. A system of conventional signs is not, however, a 'language' until it has been *internalized* (as the psychiatrists say) by the members of a social group. A language is therefore not merely the system of signs but also the whole repertory of semantic reactions which the signs produce in those who speak and understand the language. The structural assumptions implicit in a language are of necessity reflected in behavioral reactions. On this point, Korzybski is most emphatic:

> A language, any language, has at its bottom certain metaphysics, which ascribe, consciously or unconsciously, some sort of structure to the world. (p. 89)
>
> Now these structural assumptions are inside our skin when we accept a language—*any* language. (p. 505)
>
> We do not realize what tremendous power the structure of an habitual language has. It is not an exaggeration to say that it enslaves us through the mechanism of semantic reactions and that the structure which a language exhibits, and impresses on us unconsciously, is *automatically projected* upon the world around us. (p. 89)

A main contention of writers on general semantics, namely, that everyday language and, to a large degree, scientific and technical languages especially in fields not yet made rigorous, are permeated with prescientific structural assumptions, is therefore no surprise to any competently trained linguistic student. The logical consequence of this fact, that everyday discussion, public controversy, and even scientific discourse, are often made fruitless or meaningless by the unnoticed intrusion of obsolete prescientific assumptions, is also a familiar notion, vigorously argued by Lady Welby[4] and later expounded at length by Ogden and Richards[5] and by Malinowski.[6]

The respect in which Korzybski appears to me to have made his most arresting contribution and therefore gone farther than his forerunners is the degree to which he has analyzed human behavior, from the productive on the one hand (in science, for example, and in mathematics) to the unproductive and self-defeating on the other hand (in philosophical and political dispute, in propaganda, in cases of mental illness, etc.), in the light of such linguistic hypotheses. He has concluded that prescientific structural assumptions, primitive metaphysics, etc., underlie the language (and accompanying semantic reactions) of those whose labors are futile and unproductive, and that structurally more adequate and more flexible assumptions underlie the language (and accompanying semantic reactions) of those who are making signal progress

[3] For example, Philipp Frank says in *Einstein, His Life and Times:* 'Einstein's *relativity of time* is a reform in *semantics*, not in metaphysics.' See also Korzybski, *op. cit.*, p. 55.

[4] Viola Welby, *What is Meaning?* (1903).

[5] C. K. Ogden and I. A. Richards, *The Meaning of Meaning* (3rd. ed. revised, 1930).

[6] B. Malinowski, 'The Problem of Meaning in Primitive Languages,' Supplement I in Ogden and Richards' *The Meaning of Meaning.*

in their fields. The former language habits, which involve an implicit postulate of identity, he calls 'aristotelian.' The latter, which involve an explicit rejection of identity, he calls 'non-aristotelian.' Indeed, central to Korzybski's thought is his revelation of the existence in our semantic reactions of an unacknowledged postulate of identity and his explicit framing of the postulate of non-identity as a basis for re-education. The passage from aristotelian to non-aristotelian language habits and semantic reactions Korzybski regards as a generalized description of the great modern transformation of traditional habits of thought, represented in mathematics by the transition from euclidean to non-euclidean, in physics by the transition from newtonian to non-newtonian (einsteinian). As he writes:

> In the present non-aristotelian system, I reject Aristotle's assumed structures, usually called 'metaphysics' *(circa.* 350 B.C.), and accept modern science as my metaphysics. (p. 92)

Since practically all of us brought up in Western culture have internalized, and therefore manifest in our patterns of reaction and behavior, the traditional Indo-European ('aristotelian') language structure, and since these patterns of reaction are demonstrably not adequate for the solution of contemporary problems, Korzybski offers in his 'general semantics' an educational theory and discipline whereby we may hope to overcome our most pervasive and serious cultural lag—one that is largely responsible, as he believes, for other cultural lags in many fields. As Einstein recently said in his 'telegram to the people':

> Unleashed power of the atom has changed everything except our modes of thinking, and we thus drift toward unparalleled catastrophe.[7]

General semantics is an attempted anatomy of the old and new 'modes of thinking,' offering methods whereby the transition may be made.

The following are some of the features of traditional IE (Indo-European) language structure which Korzybski calls 'aristotelian':

I. The traditional structure of language, involving the so-called *'is* of identity,' tends to obscure the difference between words and things.

> An object or feeling . . . is *not* verbal, is *not* words. . . . Anyone who misses that—and it is unfortunately easily missed—will miss one of the most important psychological factors in all semantic reactions underlying sanity. This omission is facilitated greatly by the older systems, habits of thought, older semantic reactions, and, above all, by the primitive *structure* of our aristotelian language and the 'is' of identity. Thus, for instance, we *handle* what we call a pencil. Whatever we handle is un-speakable; yet we say 'this *is* a pencil,' which statement is unconditionally false to facts, because the object appears as an absolute individual and *is not* words. Thus our semantic reactions are at once *trained in delusional values,* which must be pathological. (pp. 34-35)

The generality and importance of this principle are made difficult to understand by the fact that we are all accustomed, in describing other people's misevaluations, to using mentalistic terms such as 'he doesn't think straight,' 'his ideas are wrong,' etc. It takes patient analysis of the

[7] Quoted by Lillian R. Lieber in *Mits, Wits and Logic* (1947), p. 29.

mechanics of many controversies, conflicts, case-histories of the mentally ill, etc., to appreciate fully what is meant by being trained in delusional values as the result of the failure to distinguish in one's semantic reactions between verbal and non-verbal levels. As Korzybski says, our cultural tradition, which includes structure of language and accompanying semantic reactions, helps to perpetuate this tendency. A description of this process as it takes place throughout our culture is given from a different point of view by Trigant Burrow:

> The organisms total or primary configuration is early deflected into the socially constructed system of partial reflexes we know as man's code of signs or language—a system of responses to which the organism has become verbally conditioned. So that in the human organism its primary process of adaptation undergoes at the outset secondary deflection. . . . He enters a group whose encircling, protective environment is now fashioned of those secondarily integrated reflexes that constitute for the growing organism the mere signs and intimations of things. In short, as a result of his early training, the child is enveloped not so much within a spontaneous field of total, bionomic reactions as within a field of vicarious symbols that more and more replaces his total world of objective actuality.[8]

In further illustration of our cultural tendency toward regarding the knowledge of words as the knowledge of things, we may cite the history of western science, in which the traditional philosophical quest has been to seek to 'define' the 'essences of things.' This tendency continues to show itself in the 'natural logic' of unreflective persons who feel that when a thing is *named,* one has discovered all he needs to know about it. An observable tension is exhibited by many people confronted by an unnamed object—a tension that usually disappears when a name has been given. In terms of semantic reactions, such behavior means at all levels a tendency to make one's adjustment not to objects but to names. [9]

II. Traditional language structure (and accompanying semantic reactions) divides the indivisible into discrete 'entities'—often obscuring or totally concealing functional relationships. The divisions of 'substance' and 'form,' of 'body' and 'mind,' of 'cause' and 'effect,' of 'actor' and 'act,' of 'reason' and 'emotion,' of 'space' and 'time,' etc., Korzybski calls 'elementalism.' He advocates in their place 'non-elementalistic' terms and orientations, especially in those areas of present-day thought which are stalemated. Certainly this matter of artificial linguistic divisions is not a novel idea to linguistic students, who are familiar, especially in their study of non-IE languages, with the variety of ways in which different languages abstract different categories and relationships from the flux of experience.

[8] Trigant Burrow, *The Biology of Human Conflict* (1937), pp. 251-252.

[9] 'These mere names,' as Trigant Burrow says (*op. cit.,* p. xxxviii), 'that have become the be-all and the end-all of [man's] existence.'

A trivial but revealing instance of this adjustment to names occurred in my own home recently, where I have hanging an abstract painting by the late L. Moholy-Nagy. A woman who was visiting us couldn't keep her mind on the conversation; she kept turning to stare at the painting. Apparently it was disturbing her a great deal. Finally, she walked up to it, found a tiny typewritten label on the frame saying: 'Space Modulator, 1941.' 'Space modulator, is it?' she said. 'Isn't that nice!' She sat down, much relieved. She never even glanced at it again after that.

The novel feature of Korzybski's thought is his proposal that we do something about it.

What is to be done has also been suggested by Whorf:

> No individual is free to describe nature with absolute impartiality but is constrained to certain modes of interpretation even while he thinks himself most free. The person most nearly free in such respects would be a linguist familiar with many widely different linguistic systems.[10]

Here Korzybski would feel, I am sure, that a person acquainted with modern mathematics—or at least with the methods of modern mathematics—is already in the situation of 'a linguist familiar with many widely different linguistic systems,' with the advantage, moreover, that these mathematical systems are not the haphazard residue of primitive metaphysical notions and animisms, but are systems of propositional functions, which, being deliberately emptied of content, can be given any content.

An instance of elementalism can be seen in the new book, *Body and Mind*, by Flanders Dunbar, M.D., a leader in the new, non-elementalistic field of psychosomatic medicine. She explicitly states a non-elementalistic point of view: 'Your body is your mind and vice versa.' In spite of repeated assertions to this effect, the author constantly reverts to the division of body and mind in her text, for example, 'The patient has lost the ability to have his mind maintain control of his body,'—a habit which seriously affects the accuracy of her statements.[11] Such elementalism is pervasive, of course, in many disciplines—which accounts for innumerable problems remaining 'insoluble.'

III. Traditional language structure and accompanying semantic reactions tend to be two-valued: propositions have to be either 'true' or 'false,' specified ways of behaving are either 'right' or 'wrong,' etc. Internalized, this language structure results in two-valued 'black-and-white' behavior patterns: 'Whoever is not for us is against us.' In place of these patterns, Korzybski proposes what he calls an 'infinite-valued orientation,' based on the internalizing of modern probability logics.

IV. Traditional aristotelian language structure and accompanying semantic reactions tend to ignore a fundamental fact of the functioning of the human nervous system, namely, that we abstract at an indefinite number of levels—by abstracting from abstractions, by abstracting from abstractions of abstractions, etc.

In mathematics, the procedure of symbol manipulation is such that, should a confusion of orders of abstraction occur, the system will at once make the confusion evident by exhibiting a contradiction. The efficiency of mathematics in this respect is shown by the way in which many traditional logical paradoxes, in which shifts of orders of abstraction are concealed by everyday language, are simply solved by mathematical methods. The internalizing of mathematical language structures is the mechanism proposed for escaping the limitations of semantic reactions governed by traditional aristotelian language structure. Language structure and semantic reactions that distinguish unfailingly the different orders of abstraction make possible a fuller realization of the capacities of the human nervous system and of the capacities of language as a tool of inquiry than has hitherto been common except in those limited

[10] *Op. cit.*, p. 313.

[11] See the review by Russell Meyers, M.D., of this work in *ETC.*, V, 119-125 (Winter 1948).

fields, such as modern science, where such semantic reactions are already commonplace.

The foregoing are some of the features of what Korzybski has called aristotelian language structure. Another interesting contribution is his distillation of scientific language habits and behavior into a few simple formulae ('extensional devices') which can be used to impart a 'non-aristotelian' orientation to anyone, including the very young. The value of this training in education and re-education is being investigated today in many fields.

The term 'aristotelian' as used by Korzybski can be translated 'Indo-European' for most purposes, the name of Aristotle being used largely because he was, and remains, foremost in making explicit the structural implications underlying our common Western linguistic heritage, and therefore foremost also in introducing order into Western thought. This order has been, of course, of incalculable value in the development of Western civilizations, but it has, as the consensus of modern scientists holds, long since reached the limits of its usefulness.

The term 'non-Indo-European,' however, cannot be substituted for Korzybski's 'non-aristotelian,' since historic non-IE languages carry as many (although probably different) conscious or unconscious primitive metaphysical, prescientific, and animistic assumptions as IE languages—possibly more. It is to be hoped, nevertheless, that linguists, especially students of non-IE languages, might be persuaded to examine afresh, in the light of Korzybski's theories, the relationships between language structure and behavior with a view to increasing our present scant knowledge of this subject[12]. It is a topic of obvious importance not only to education, but the even bigger job of re-education, which is the principal task of most education today.

[12] See 'Linguistic Reflection of Wintu Thought,' by D. Demetracopoulou Lee, in *ETC.*, V, 174-181 (Spring 1948) for an extremely valuable analysis of the structural assumptions underlying one non-IE language. More similar analyses are urgently needed.

Social science will doubtless become, as physical science already is, an important influence in determining the wants of men. That is, as a result of scientific knowledge men will not want impossible or mutually exclusive things. They will not seek to increase foreign trade and at the same time establish more comprehensive and higher tariffs. They will not seek to reduce crime but at the same time maintain a crime-promoting penal system. They will not destroy the productive power of a nation and still expect it to be peaceful, prosperous, and democratic. They will not expect a world organization to be confined into existence by semantically deranged 'statesmen,' before the necessary preceding integration of the constituent units has been achieved.

GEORGE A. LUNDBERG, *Can Science Save Us?*

THE NERVOUS SYSTEM AND GENERAL SEMANTICS:

I. *The Aims of General Semantics and the Method of Science*

RUSSELL MEYERS, M.D.*

IN THE FIRST lecture of the present series, Dr. Lee (28) made the significant observation that it is a common characteristic of our behavior that we tend unwittingly to bring a well established stock of already prepared 'images' and language stereotypes to the 'real' people, situations and things of our daily experience. Such images and their accompanying word habits, while of course related in some measure to the people, situations and things with which we may be confronted at a given moment, can in no sense be regarded as close simulacra of those that would be evoked in us were our perceptions to arise more immediately from the actualities of experience. Dr. Lee demonstrated by numerous illustrations drawn from familiar experience that these prefabricated images and verbalizations constitute potent determinants of the *modes of action* regularly exhibited by us in the presence of 'real' people, situations and things. While often affording us a genuine advantage, particularly when clearly identified for what they are and when kept rigidly within the bounds of their verifiable limits, these stereotypes can and commonly do seriously interfere with our endeavors to deal in an effective and broadly adaptive way with the problems posed for us in the course of daily living. The more lamentable aspects of the behavioral processes to which we refer have been skillfully set forth with uncommon semantic insight and inimitable art by Mr. James Thurber (41) in a delightful fable entitled 'The Tortoise and the Hare,' permission for the reproduction of which has been kindly granted by the author and publisher.

There once was a wise young tortoise who read in an ancient book about a tortoise who had beaten a hare in a race. He read all the other books he could find but in none of them was there any record of a hare who had beaten a tortoise. The wise young tortoise came to the natural conclusion that

* Associate Professor of Surgery, College of Medicine, State University of Iowa; Chairman, Division of Neurosurgery, University of Iowa Hospitals. This paper was originally presented as the second lecture in the 4th Annual Lecture Series sponsored by the Chicago Members of the Society for General Semantics, February 13, 1948, Chicago, Illinois. Incorporated in the present paper and those scheduled for later issues of *ETC.* is material from the author's presentations of April 29 and May 6, 1948, before the Seminar on General Semantics, Chicago, Illinois.

he could outrun a hare, so he set forth in search of one. In his wanderings he met many animals who were willing to race him: weasels, stoats, dachshunds, badger-boars, short-tailed field mice and ground squirrels. But when the tortoise asked if they could outrun a hare they all said no, they couldn't (with the exception of a dachshund named Freddy, and nobody paid any attention to him). 'Well, I can,' said the tortoise, 'so there's no use wasting my time on you.' And he continued his search.

After many days the tortoise finally encountered a hare and challenged him to a race. 'What are you going to use for legs?' asked the hare. 'Never mind that,' said the tortoise. 'Read this.' He showed the hare the story in the ancient book, complete with moral about the swift not always being so terribly fast. 'Tosh,' said the hare. 'You couldn't go fifty feet in an hour and a half, whereas I can go fifty feet in one and a fifth seconds.' 'Posh,' said the tortoise. 'You probably won't even finish second.' 'We'll see about that,' said the hare. So they marked off a course fifty feet long. All the other animals gathered around. A bullfrog set them on their marks, a gun dog fired a pistol, and they were off.

When the hare crossed the finish line the tortoise had gone approximately eight and three-quarter inches.

MORAL: *A new broom may sweep clean, but never trust an old saw.*

From the viewpoint of the general semanticist, this entertaining little fable bears some very serious implications. He has no difficulty in imagining, for instance, that the misguided tortoise might have placed a substantial side-bet on his prowess as a sprinter, in which case his stereotyped images and word-habits might have resulted in his being placed under heavy debt to the hare for the rest of his life and in subjecting his wife and children to long-standing deprivation. Beyond this, the semanticist can imagine the tortoise's friends calling 'Shame!' at the hare, perhaps going so far as to level charges of fraud and imposture against the scoundrel who so willfully upset the revered doctrines endorsed by the books. The counter-resentment of the world of hares, rabbits and rodents-at-large against such unreasonable and hostile charges might easily be fancied as capable of plunging the animal world into a futile and exhausting global conflict.

The general semanticist contends that, like the tortoise, we have unwittingly drawn and uncritically accepted for our guidance thousands of metaphorical *maps* ('abstractions,' 'images,' 'stereotypes') that correspond in gravely imperfect ways to the *territories (i.e.,* 'realities') they are supposed to represent. He holds that we err yet more seriously when, in traversing the territory itself and upon encountering significant geographical features unrepresented on the map (such, for example, as stubborn impasses), we doggedly insist upon the correctness and reliability of the map and impute to the territory itself a fictional character. It is apparent that under such circumstances the map may very seriously impede our efforts at adaptation to the vicissitudes of living. 'The WORD,' avers the general semanticist, 'is *not* the THING; the MAP is *not* the TERRITORY.'

Consider by way of illustration the familiar abstractions 'up' and 'down.' Here is a language habit very likely as deeply established in those of us of the present era as it was in the more advanced thinkers among the ancients who first occupied themselves with the problems of guiding their camels over the deserts and

of navigating their ships on the high seas by observation of the stars. The 'up-down' concept is, of course, far more often implicit in the activities of humans than it is explicitly identified as such. When applied to events taking place within the frame of reference of circumscribed portions of the crust of our own globe, it is a highly useful concept, subject to empirical verification. But it obviously has no useful meaning when applied to a quite different frame of reference, *e.g.,* heavenly bodies or beams of light moving through interstellar space. Nevertheless, when the science of astronomy was in the early phases of its development, the habit of dealing with things in 'up-down' terms was evidently so well established among the philosophers of the day that it was unwittingly included within their deliberations and in this fashion came to play an insensible but crucial role in the formulation of the concepts of the universe at which they arrived. As subsequent developments have amply proven, the 'up-down' formulation impeded for centuries the endeavors of philosophers to arrive at substantial and self-consistent explanations of the phenomena about them. For them, the simple and obvious 'facts' were that the sun *came up* in the morning and *went down* at night. Similarly, the moon and stars *rose* and *set*. It followed 'naturally' from such verbal formulations that the earth must be the center of the universe; that it must be immobile; and that all heavenly bodies must rotate about it.

A coexisting language habit equally well established among the venerable philosophers of those dimly distant days had to do with the conviction that the circle is *the* 'perfect' figure. This notion, taken with yet another universally acknowledged formulation to the effect that in making the Universe, God, being himself perfect, must surely have made the planets and stars to travel in their orbits along pathways of 'perfect' figures, likewise led the ancients away from confirmable astronomical observations. With three such faulty word-maps it was inevitable that glaring inconsistencies and self-contradictions should characterize the slowly accumulated 'factual' data of the science. Their own language-engendered stereotypes may be said to have baffled astronomers for centuries. The simple recognition by scientists of a later age of the inapplicability of the 'up-down' abstraction to the inter-stellar frame of reference made possible the resolution of many of the then existing difficulties, opened wide, new vistas for the acquisition and 'meaningful' interpretation of data, and paved the way for the development of the modern science of astronomy.

A comparable difficulty beset the science of physics for centuries in consequence of failure on the part of scientists to realize that 'temperature' and 'heat' are not the 'same.' Einstein and Infeld, (9) in tracing the evolution of modern physics, relate that even after Black had succeeded one hundred and fifty years ago in clearing the way to greater understanding, it took an unbelievably long time for physicists to distinguish between these concepts. Once the obfuscation was dispelled by a proper semantic revaluation, rapid progress resulted.

A third and perhaps more poignant illustration of the prevalent practice of insisting upon the reliability of the 'map' and the fictional character of the 'territory' is to be found in the traditional formulations of American culture bearing upon the marriage institution, monogamy, divorce, virginity and sexual practices in general. From time to time lay writers (47) have extrapolated the findings of 'sexologists' (10, 11, 27, 40) and have

directed attention to some of the more glaring disparities between the moral and legal codes (to which high verbal homage is habitually paid in American culture) and the actual behavior exercised by humans in 'real' life. Until very recently it has been both possible and convenient for the map-smitten to dismiss such writings as the preposterous offerings of embittered cynics or, what constitutes an even more devastating practice, to acknowledge their relevance at most to the 'depraved,' 'abnormal' and 'exceptional' segments of society (35). The recently published report of Dr. Alfred Kinsey (22), representing as it does the first scientifically validated study bearing upon a crucial and long-avoided subject, namely, the sexual behavior of the human male, goes far in the direction of documenting what certain lay writers have long contended. Its implications ramify extensively throughout our folkways and mores and clearly indicate how erroneous are our time-honored maps and how severely they stand in need of revision. It will be of considerable interest for the student of human behavior to observe during the next few years the semantic effect of the Kinsey report upon the lofty ratiocinations of the map-smitten. That it will evoke any immediate or widespread endorsement by those who at present stand in a favorable position to alter the maps is perhaps too sanguine an expectation. We have only to reflect upon the adamant resistance encountered by Galileo, Jenner, Pasteur, Semmelweiss, Darwin and Lister to remind us that much painful ground must be covered before the map can be revised.

Further illustrations of the grave disparities between many of our verbal formulations and the 'realities' which they purport to represent are to be found in Stefansson's (39) ironical little book, *The Standardization of Error*. In this, an explorer of extensive experience shows how false-to-fact are the formulations daily taught by schoolteachers concerning (a) the ostrich who (by definition of literature, sermon and moral precept) 'solves' his problem by burying his head in the sand; (b) the Eskimos who (it is asserted) commonly live in snow houses; (c) wolves who are represented in literature and the movies as running in large packs of scores or even hundreds; (d) the ever-present coldness of the Canadian, Siberian and arctic climates; and (e) the 'common sense doctrine,' long ago pronounced by the Greeks, that the farther north one travels from the equatorial zone at any time of year, the colder the temperature. 'The most striking contradiction of our civilization,' says Stefansson, 'is the fundamental reverence for truth which we profess and the thoroughgoing disregard for it which we practice.'

The general semanticist imputes the origin of such impediments to effective thinking-and-doing as we have been illustrating to certain long-established language habits which apparently developed hand in hand with magic, religion and similar prescientific orientations of early man toward his universe. Such habits, conveniently designated in semantic idiom as 'aristotelian,' were evidently already ancient practices when Aristotle first catalogued them three and one-half centuries before Christ. Promulgated since then and ardently defended against attack by one or another authoritarian group, they have come down to us of the modern era scarcely altered in their original form and substance. It is not a little dis naying, then, to reflect that for more than twenty-three centuries certain rigid and ill-gotten language habits of dubious origin but unmistakable prestige have played crucial roles in the daily thinking-and-doing not

only of the laity but, with all too few exceptions, of scientists as well. The formal recognition that throughout its history science has in numerous instances labored painfully along futile pathways, merely because of its failure to take into account the subtle influence of aristotelian language structures upon its manner of observing and arranging data and of reaching formulations of the macroscopic and microscopic universes, is a service that has been largely performed by general semantics.

It is of course true that from time to time writers of exceptional insight, such as Thomas Henry Huxley (14) and A. B. Johnson (15), have had strong intimations of the precarious effect of language habits upon their efforts to resolve the problems with which they were engaged. It is to the enduring credit of Alfred Korzybski (24), however, that the most serious defects in the machinery of human communications were at last identified and their origins perceived to be the inevitable consequences of aristotelian habits of 'thinking,' 'feeling' and speaking. Korzybski provided a sorely needed *language for talking about language,* familiarizing us with the very serious limitations imposed upon adaptive behavior by such Indo-European language practices as *absolutism, elementalism, one- two- and three-valued orientations, inadvertent use of multiordinal terms, allness reactions, signal reactions, 'ventriloquizing' tendencies, unconsciousness of projection and abstraction, evaluative rigidity, static labeling, and inappropriate appeal to the 'laws' of formal logic, e.g., identity, noncontradiction,* etc. He recognized that the defects in the machinery could be overcome only by developing a non-aristotelian orientation in respect of language and thought habits and he proceeded to evolve a broad theoretical system which, while readily accommodating aristotelian formulations, confined their employ to those frames of reference to which they properly apply.

In contemplation of the host of language-engendered impediments to human adaptation, general semantics has arrived at the rather startling conviction that in the arts, the natural and social sciences, and the humanities, no inquiry can be properly projected, no phenomenon adequately examined, no understanding competently reached and no course of action fittingly recommended which fails to take into account the 'abstracting' role of the perceiver and the inhibitory and facilitative effects of his established language habits upon his process of 'abstracting' (32). By revealing within our Indo-European language structure serious encumbrances to adaptive thinking-and-doing and by giving emphasis to the reciprocal effects exerted between language behavior and non-language behavior, general semantics has given a new and urgent meaning to the ancient metaphysical engagement with the problem of the relationship between 'language' and 'thought' (33) and has employed the methods of science for the exploration of an area heretofore but dimly suspected as being at all under necessity of critical examination, namely, our language habits and language structure.

Finally, it has adduced considerable evidence to support the belief that through a proper revision of language habits it may prove feasible to accomplish a unification and integration of enormous funds of knowledge at present confined within the bounds of special disciplines. In view of the ever-widening schisms resulting from the intensive development of all sorts of 'specialties' within the several arts and sciences, the likelihood of achieving such a desirable circumstance

has long been for many serious thinkers a matter of despair. General semantics, cutting as it does across all the learned disciplines and insisting that the latter exist in large measure by virtue of their language symbols, points the way to an effective and economical consolidation of their now disparate symbol-systems and promises large rewards in the form of improved communication and the disclosure of hitherto unsuspected relationships obtaining among the arts, sciences and humanities.

II

At this point we may profitably raise the question, 'At what does general semantics aim?'

Its ultimate goal is, in the opinion of Alfred Korzybski (23, 26), nothing less than the construction of an applied anthropology, an empirical *science of Man* emphasizing the processes of evaluation as dynamic and inseparable components of the individual's behavior. Korzybski has envisioned and in no small measure has already contributed to the formulation of substantial theories and operational principles such as may lead to *more reliable predictions* in respect of man's 'ethical' and 'aesthetic' evaluations, particularly of his socio-politico-economic behavior, and to increasingly *more adaptive manipulations,* by, of and for man. General semantics aims at protecting the individual against exploitation by others and by himself (34). The generalized system thus evolved constitutes a new, non-aristotelian approach to the business of living.

It may be urged, of course, that these goals differ in no significant respects from those traditionally sought by academicians engaged in psychologic, sociologic, anthropologic and philosophic pursuits and, for that matter, avowedly cherished by political office-seekers, cartel magnates, and numerous other 'well-meaning' individuals allegedly working for the common weal. With this contention no serious issue can be taken. The distinctive contribution of general semantics toward the solution of humanity's manifold problems is much less a matter of pursuing goals designated by such abstract and seemingly innocuous terms as *predictability* and *manipulability* than one of insisting that the tools necessary to their attainment are already at hand, waiting to be utilized.

A second question follows naturally from our answer to the first: 'How does general semantics propose to realize its aims?'

The answer to this is simple enough in principle, though considerably complex in its ultimate detail. We shall limit our remarks here to a consideration of the principle only. General semanticists have found it warrantable to repose their trust, at least for the present, in the mechanism known as scientific method (2, 6, 7, 12, 18, 24, 29, 31, 44, 46). They recognize in it a *modus operandi* for the acquisition of knowledge of people, situations and things immeasurably superior to other commonly employed procedures, such as intuition, inspiration, divine and other forms of supernatural revelation, 'definition,' 'transfer of learning' from one discipline to another, appeal to 'authority,' formal logic (as exemplified in aristotelian procedure), and subjective impression based upon 'experience.' They have gone somewhat further in avowing a belief that scientific method is potentially applicable to investigations in *all* areas of human activities—the arts, humanities, and commonplace human endeavors of every variety as well as the natural sciences. They have emphasized with earnest insistence the necessity of its being employed not

merely in an occasional and narrowly delimited situation (such as for the determination of the inhibitive powers of penicillin upon the growth of certain bacteria or of the relations between poverty, feeble-mindedness and prostitution), but habitually, generally and perennially in the course of human events—within the family circle, over the back fence, at the local Rotarian's meeting, in the courtroom and state legislature and at international peace conferences (32). This recommendation is perhaps the most distinctive and pragmatic contribution of general semantics to the solution of the numerous urgent problems in human relationships with which we are faced today.

General semanticists have already covered a small but significant amount of ground in demonstrating the efficacy of scientific method as applied to the solution of special problems in education, industrial management, psychopathology, preventive mental hygiene, social adjustments for the individual and the group, moral values and aesthetics (1, 3, 4, 5, 7, 13, 16, 17, 20, 21, 25, 36, 37, 38, 42, 43, 45).

As an inseparable component of its adopted task, general semantics has been impressed with the necessity of *improving communications* among individuals and peoples, not—as Dr. Lee has so well pointed out—by a mere increase in the amount of data revealed and exchanged, but by encouraging an awareness of the intimate relationship between our *maps* and the *territories* to which they are supposed to correspond.

III

Frequent reference has been made in our present discourse to scientific method. It now becomes necessary in the interest of avoiding equivocation to elucidate the meaning (for us) of this term. The term *science* first requires to be distinguished from that of *scientific method*. The two are often erroneously thought of as synonymous. We shall regard *science* as a generic term which embraces the body of *technologic data* ('knowledge') at our command, including all the technical achievements, formulae, directions, constructs, 'laws,' etc. that relate thereto. The *modus operandi* through which it has been possible to arrive at the bulk of these data, constructs, laws, etc., we shall designate as *scientific method*. To illustrate: an accurate description of the color, taste, weight, volume and other so-called physical properties of a ten percent solution of common table salt in water; a catalogue of the chemical agents with which such solution is capable (and incapable) of reacting; a statement concerning the uses now known and theoretically capable of being known to which the solution may be put; information concerning the distribution of salt and salt solutions on our planet and on other heavenly bodies a symbolic representation of the ionized form of NaCl in solution; and a tabulation of whatever principles, laws and other generalizations (abstractions) seem (in our day) relevant to the above—all these and similar matters constitute some of the *technical data* and *scientific knowledge* bearing upon our salt solution. On the other hand, the broad principles underlying the procedures by which such 'knowledge' was first acquired (and later expanded and verified to such extent that qualified scientists in many lands and in successive periods of time have been able to concur with one another in regard to it) constitute *scientific method*.

From what has been said, one may infer—what is readily enough confirmable through contacts with many students of science—that it is quite possible for an individual to be in possession of a consid-

erable fund of such knowledge and yet be quite incapable of formulating the *procedures* by which he and/or others have acquired it. This circumstance is, after all, no stranger than comparable circumstances already familiar to us in connection with other human activities. A pole vaulter, for example, may be able to turn in consistently near-record performances without being able to abstract the *principles* he regularly puts to use in the job of clearing the cross-bar, much less to communicate the principles to team-mates ambitious to emulate his performances. A competent coach, on the other hand, irrespective of whether he himself has been a pole vaulter, *is* competent in large part because of his ability to *discriminate, abstract and generalize* the significant nuances of sensori-motor activities exhibited by successful vaulters. His competence in this connection (like that of scientific method itself) becomes objectively measurable in terms of the *results obtained* when he attempts to utilize the abstracted principles for improving the performances of other vaulters.

With these preliminary remarks we proceed to an outline of the *modus operandi* that constitutes scientific method.

Schema of Scientific Method

I. Formulation of the Question (following a 'Felt Need')
The Role of General Semantics.

II. Collection of 'Factual' Data Through:
a) Observation, b) Experimentation, and c) Statistical Analysis.
The Role of the Principle of Control.

III. Tentative Ordering, Arrangement and Classification of Data.
The Role of General Semantics *in re* Underlying 'Postulates.'

IV. Tentative Derivation of GENERALIZATIONS (Hypothesis, Theory, Construct, Principle, Law, Etc.)
The Role of the Principle of Parsimony.
The Role of Mathematic Treatment.
The Role of General Semantics *in re* the Process of 'Abstraction'.

V. Further Collection of Data (See II above).

VI. Re-examination of Generalizations in the Light of Newly Acquired Data.

VII. Retention, Rejection or Revision of Generalizations as Indicated by Re-examination under VI.

VIII. Repeat V-VII, etc. etc.

In contemplation of this outline, two matters merit particular notice: first, that retained hypotheses, theories, constructs, principles, 'laws,' 'truths,' etc. are properly regarded by scientists as *tentative* formulations only, subject always to revision or rejection; and second, that there are but two criteria by which the validity of scientific hypotheses, theories, 'laws' and 'constructs' may be measured, namely, *predictability* and *manipulability of materials to (seeming) advantage*. These considerations afford us some appreciation of one of the essential characteristics

of *empirical science:* there are recognizable no implicit convictions as to the existence of 'absolutes,' 'universals,' and 'eternal truths,' such as are identifiable in many ancient medieval and modern religious and philosophic systems of thought.

Reference has been made to the *principles* of *control* and *parsimony*. Neither of these constitutes in itself an indispensable component of scientific method (in the sense in which the *collection, classification* and *interpretation* of data are to be considered). It is, indeed, conceivable that the goals of predictability and manipulability might be pursued by the method of science without the exercise of either or both of these *principles*. Nevertheless, their application has so consistently paid dividends in the sense of economizing time, money and effort and in consolidating gains already made that they have by now become intimate if not integral components of scientific method.

The *principle of control* asserts the necessity of ruling out (or at least of identifying and allowing for) the potential influence of all concomitant and adventitious factors whenever the functional relationship between a *constant* and a *variable* or between two or more variables is under inquiry. Stated in terms of a specific example, this generalization means that if an investigator sets out to determine the relationship between, say, urinary output and water intake in the human, it does not suffice that he merely measure and record the quantities of urine collected within a given time period following the ingestion of known quantities of water. Obviously, numerous other factors, some identifiable, others the existence of which may only be surmised, but in either case *not* factors of water intake, may impose themselves, singly or in combination. Such factors may so alter the recorded urinary output as to vitiate both the experimental findings and the interpretations derived therefrom. It therefore becomes a major responsibility of the investigator to 'control' concomitant dietary components (the carbohydrate, fat, protein, salt and vitamin intakes) of each individual employed in the inquiry; to maintain at constant levels the temperature, humidity and air currents of the room in which they remain during the period of study; to regulate as closely as possible the muscular exercise indulged in; to eliminate all drugs, (*e.g.*, cathartics and caffein in coffee) that might modify urinary output and the quantities of fluids eliminated in sweat, feces, saliva and respired air; to insure that all water ingested is of similar composition; etc., etc. As soon as the existence of such adventitious agents is recognized, the necessity of instituting appropriate *control* studies becomes apparent.

In many investigations, particularly in the biologic, psychologic and sociologic areas, the presence of multiple, extraneous variables of the sort we have been describing must be presumed to exist. Some of them escape identification. Others, although identifiable, may be incapable of control by measures at present available. It is in such instances that the employment of *statistical methods* proves a highly valuable adjunct to modern research. By the use of a sufficiently large number of cases, the influences imposed upon the phenomena under study by unidentified and uncontrollable variables may be minimized. The presumption is that such tend to 'cancel' themselves out. The present-day investigator has at his command a number of highly useful and (when properly applied) dependable statistical formulae that permit him to hold his variables and invariants under fair control.

The *principle of parsimony*, apparently first expressed by the rebellious monk, William of Occam, (1270-1349 ?), may be recast for present-day uses somewhat as follows: *Of two or more rival hypotheses purporting to account for a body of phenomena, that is scientifically preferable which, regardless of the complexity of its details, invokes the least complexity of separate principles.* This is broad counsel looking toward the unification and integration of all available 'knowledge.' We shall have occasion to refer again and again to this valuable formulation in later parts of our inquiry. A conspicuous recent confirmation of its applicability is illustrated by the equating of *energy* and *mass* in the now familiar einsteinian formula, $E = Mc^2$ (energy equals mass times the square of the speed of light in cm. per sec.). Before the development of the special and general theories of relativity by Albert Einstein, the differences between energy and mass were conceived to be qualitative and, as such, not equatable. Such distinctions were widely accepted by newtonian physicists as 'well-established postulates' and 'self-evident truths.' The subsequent evolution of the field-physics notion that energy and mass are merely *quantitative* variations of one another (9) and the subsequent derivation of a mathematical equation expressing the pertinent experimental findings in abstract form had the refreshing effect of freeing many scientists from language habits that had severely hampered their endeavors to reconcile certain self-contradictions within newtonian thermo-dynamics and electronics. Within forty years, the innocent-appearing equation, $E = Mc^2$, became dramatically extensionalized for the peoples of a war-ridden world when, in August 1945, Hiroshima and Nagasaki were destroyed. Here, then, is a striking example of the results that may follow the utilization of the principle of parsimony.

Returning once again to our schema of scientific method, it will be observed that general semantics is conceived of as playing an important role in virtually all aspects of this procedure. 'The language of science,' as Wendell Johnson (18) has so well expressed it, 'is the better part of the method of science.' At the very outset, the *manner of formulating a question* (which in turn may set into motion a more or less intensive investigation directed at reaching an answer) poses an acute problem of general semantic nature. General semanticists (18) have given particular emphasis to what is commonly enough acknowledged in lip service but all too frequently disregarded in situational behavior, namely, that *the terminology of the question determines the terminology of the answer.* A question must be *meaningful* to the end that it is answerable in words that refer, directly or indirectly, to the only two possible sources of information we possess: events within the nervous system and the external events by which they are effected (19). It is clear that no amount of inquiry, however serious, can answer puerile questions such as, 'Could Superman lick Joe Louis?' Yet, quite comparable questions are daily being raised in our own Congressional committees and at the current sessions of the United Nations. What is even more serious, 'answers' considered competent as a basis for the adoption of domestic and foreign policies are being reached.

General semantics urges that each investigator keep before him an awareness that in every scientific investigation *there is an observer* observing the phenomena under study, arranging them, assigning symbols and abstracting generalizations from them. It contends that these behav-

ioral processes are inevitably influenced to some greater or smaller degree by the past acquired habits of thinking and verbalizing of each observer—habits of which he may be and usually is quite oblivious. It insists that its formulations and constructs concerning the reciprocal relationship between the observer's language and non-language behavioral processes are no less important considerations in the course of a scientific inquiry than the formulations and constructs of the scientific disciplines more manifestly implicated.

The age in which we now live is often referred to as 'The Scientific Era.' It should not be supposed from this designation, however, that scientific method has in any large sense displaced the more ancient prescientific approaches to the broad task of manipulating ourselves and our environment to greater human advantage. Comparatively speaking, we have done little more than make a start in the utilization of this *modus operandi*. It is undeniable, of course, that technologic achievements are demonstrable at every hand—manifest as the impressive length of our bridges, the height of our buildings, the speedy dispatch of our several modes of travel, transportation and communication, the per-acre yield of our cornfields, the sewage disposal plants of our modern cities, the extended span of life, etc., etc. But brief reflection upon the conduct of affairs of state quickly reminds us that we have not yet begun to exercise scientific method in those broad areas of human relations—political, social and economic—wherein it promises results no less imposing than those already realized in the natural sciences. Considering the phenomena actually embraced by the term 'human relations,' it is difficult to see how these can be regarded as in any sense less 'natural' than the social behavior of bees and ants or, for that matter, the behavior of colloid particles in relation to a boundary interface under various conditions of temperature, hydrogen-ion concentration, electrical potential, etc. It is therefore difficult to comprehend the unvoiced but dogged prejudice that prevails against the use of scientific method in dealing with the social problems of our day. In his recent book, Lundberg (30) has lamented this circumstance sorely. 'Nobody,' he says, 'including many social scientists, really takes science seriously in such connections. . . . Scientific information of a more or less reliable character is more widely diffused than ever before, but the scientific mode of thought has obviously made very little headway.'

There are, of course, many individuals who stand ready to deprecate the application of 'science' to social problems on the ground that, in spite of the extensive scientific advances of the past hundred years, the world, regarded from the standpoint of human relationships, finds itself now in a 'worse mess than ever before.' One may recognize in this dim syllogism at least two vulnerable points. First, 'scientific advances,' *i.e.*, technical knowledge and technological achievement, are here represented as if *equal to* scientific method. An inference is then drawn from the former and is made to appear as if derived from the latter. Secondly, the minor premise of the syllogism (that concerning the 'mess') is gratuitously assumed to be factual whereas it is in point of fact a matter wide open to debate. It is clear in any case that in regard to these issues no defensible conclusion, favorable or unfavorable, can at present be reached, for the reason that scientific method as such has not been sufficiently employed in the socio-politico-economic milieu to permit an evaluation of its impact.

Just as it is important for us to realize that a small fragment only of the total day-by-day activities of this 'scientific era' can justifiably be regarded as scientific, so it is important for us to realize at the outset of our discussion that scientists, for the most part, are 'scientific' in but a small part of their day-by-day activities. To the extent that they exercise scientific method they deserve to be called scientists; otherwise, they ought to be regarded as laymen in whom scientific habits of thinking-and-doing are insensibly admixed with prescientific habits. The most renowned among them at times exhibit behavior which is startling for its unscientific character. For this reason, not all utterances of men of science deserve equal esteem. The appropriateness of counsel of this sort appears obvious enough. It is nevertheless patently clear, from the 'allness' responses of the educated laity to non-scientific writings of otherwise reputable scientists, that the gun of prestige smites heavily. No better illustration of the point can be found than in the generally enthusiastic endorsement of Lecompte du Noüy's latest book, *Human Destiny* (8). Page after page exhibits obfuscation of meaning, *a priori* prejudice, identification of inference with fact, authoritarianism, and wide disregard of logic, and scientific method. Yet it appears that, for the majority of readers, the scientific merit of Dr. du Noüy's researches in zoology and biophysics is sufficient to render convincing all else that he sees fit to write.

General semantics has assumed among other responsibilities the task of improving communication to the ends that (a) social relationships at large may be improved, and (b) humans may eventually come to manipulate the 'organic' and 'inorganic' constituents of their world (including themselves) to broader cultural and material advantages than seem capable of realization along current prescientific lines. It is apparent that if communication among humans is to be bettered, the pursuit of this goal demands that (among other things) the general semanticist examine critically certain 'bedrock terms' that recur over and over again in the literature of the sciences, arts and humanities and in the everyday language of the man on the street. He is under compulsion to question whether and to what extent our thinking-and-doing is determined by the very employment of such terms, whether palpable referents can be found to correspond to them, whether they are capable of being reconciled and integrated with other terms, concepts and referents substantially endorsed by all disciplines—in brief, to ascertain whether they can stand the rigorous test of scientific method. Having committed himself to the pursuit of such goals, the general semanticist, upon encountering severe obstacles, allows himself no refuge in talk about 'imponderables,' 'inscrutable mysteries,' etc. He is compelled, in regard to questions like those just raised, either to demonstrate the existence of self-consistent and satisfying answers (in an *adaptive* sense) or to acknowledge his present impotence so to do and to set afoot new operational inquiries which promise to resolve the relevant issues.

An illustration may help us to comprehend the sort of task that confronts the general semanticist. Let us suppose that two individuals, Mr. A. and Mr. B., are picked up in different parts of the city on a given night by the police. It happens that each is charged with having thrown a brick through a plate glass window. We are present during the arraignment of Mr. A. and Mr. B. before the city magistrate. Let us imagine that since each defendant pleads guilty to the offense no

question exists as to whether the accused actually threw the bricks as charged. We listen to the account offered in each case. Each culprit asserts that he had been personally offended by the owner of the premises which he damaged. It is finally settled to the satisfaction of the court that Mr. A. was 'responsible' for his act—that at the time he committed the offense he knew 'right' from 'wrong' and that he neverthless 'wilfully' threw the missile. This individual is convicted of a felony and in due course is sent to a penal institution. In contrast, the evidence bearing upon the case of B. is such that the court comes to regard him as suffering from a form of manic-depressive psychosis in a hypomanic phase. Mr. B. may or may not have known 'right' from 'wrong' at the time of his offense, but whether he did or not, he is considered, in view of his psychosis, to have been 'not responsible' for his act—to have been incapable of the proper exercise of 'will power' and self-restraint. B. is thus regarded as a *sick person,* and in due time is sent to a mental hospital.

A little reflection upon these fictional cases reveals that the final disposition was in each instance determined in large measure by the supposition that there 'genuinely exists' such a thing as 'free will' —a 'mental function' which makes 'choices' possible and which subtends the exercise of 'responsibility'. A. is said to have had it, whereas B. had it not. The uncritical adoption of the premise concerning 'free will' automatically provided the basis for the action of the court. This sort of thing occurs thousands of times daily.

The general semanticist, however, is not content to resolve human problems in so arbitrary a manner. Observing that the mere circumstance of the ubiquitous use of terms such as 'free will,' 'will power,' 'choice,' etc. does not *per se* guarantee the existence of corresponding *referents,* he inquires whether warrantable grounds exist for employing them and related notions as crucial determinants in the endeavor to solve the problems to which they are habitually applied. As has been done in comparable situations (17), he would characteristically project an 'extensional' investigation—making full use of the precepts laid down by scientific method and of the formulations of general semantics—directed at reaching supportable answers. If, in the course of investigation, he should succeed in reaching more satisfying answers than those at present available, he would offer to the court and legislature such recommendations as appear to follow from his findings, with the hope that they might be applied for the solution of the ever-growing problems of mental disorder, crime, delinquency, etc.

In the foregoing we have brushed across an issue that arises from the notions of 'free will,' 'volition,' 'choice' and 'responsibility' that permeate our linguistic culture. It is our intention to examine this question in fuller detail at a later time. Numerous other verbalizations of comparable bedrock character may now be listed.

1. Reality and Unreality
2. Voluntary and Involuntary Activities; Will and Reflex
3. Mind and Body
4. Thought and Speech
5. Intellectual and Emotional Proccesses
6. Abstract and Concrete Thinking
7. Consciousness and Unconsciousness
8. Organic and Functional Diseases
9. Idiopathic and Symptomatic Disorders

10. Cerebral Centers
11. Sensory and Motor Cortical Functions
12. Cortical and Thalamic Levels of Neural Function
13. Cerebrospinal and Autonomic Neural Functions
14. Painful and Pleasurable States
15. Hereditary and Environmental Factors
16. Objective and Subjective Data

Obviously, many others could be added to this list. Their common characteristic (and that which impels attention from the semantic viewpoint) is that such terms are generally assumed to stand for substantial and verifiable referents, so substantial, indeed, as to render their employment for the solution of specific human problems wholly warranted. The first seven items on the list are so frequently encountered in the spoken and written language of the man on the street as to require no documentation. They, together with the other nine, appear over and over in the current literature of neurology, psychology and psychiatry, serving as a (metaphorical) substrate within which most other data and concepts are held in suspension and by which they are bound to each other to constitute a 'meaningful whole.'

To examine each of these critically from the semantic viewpoint and to attempt to endow them with meanings that would meet the demands of general semanticists would require volumes. Of necessity, therefore, any consideration of them that we embark upon must be acknowledged as highly incomplete. Fortunately, much of what can be said in regard to any one of them serves to elucidate one or more of the others, for they all turn out to be dependent to some degree upon one another.

(To be continued)

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HORACE BUSHNELL:
Precursor of General Semantics

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A CURIOUSLY MODERN viewpoint of language—a viewpoint that approximates in a surprising number of instances the principles of general semantics—was promulgated in 1849 by Horace Bushnell, a Congregational Minister of Hartford, Connecticut, and was published in February of that year in his book, *God in Christ*. When the book appeared, a reviewer writing in the *New Englander* asserted:

> Never was a book more open to attack from every quarter—never was a book more avowedly liable to all sorts of misapprehension and logical misconstructions—than this book of Dr. Bushnell's. Some will add, never was a book more defiant of attack, or more careless about commending itself to the understanding of those whose habits of reading have made them inexorable in demanding coherence and consistency in argument.[1]

And, indeed, Bushnell had produced a book that was to become the core of a protracted and bitter controversy. The theological views expressed by Dr. Bushnell were regarded by many Congregational ministers as obvious heresy, and proceedings were begun to have Bushnell excluded from fellowship in the Congregational Church.

'The Hartford Central Association appointed a committee to enquire whether Dr. Bushnell's book was a sufficient reason for putting him on trial before the Hartford North Consociation.'[2] The discussion of his work, and his spirited defense of it before the Central Association, really constituted a trial of Bushnell's views before his brothers of the Congregational Church. Although he was acquitted of having propounded 'fundamental errors,' his critics were not satisfied.

> There came renewed attempts by other Congregational Churches to bring him again to trial, and these attempts were defeated, not on the merits of the controversy, but upon the technical ground of want of jurisdiction. Then, to evade further proceedings, his own church withdrew from the 'consociation' of churches of which it was a member.[3]

Despite repeated attempts to have him arraigned, Bushnell was never again formally tried. But for many years after the appearance of his book the clergymen of Hartford and neighboring towns refused to 'exchange' with him or to allow him to preach in their pulpits.

To the student of general semantics,

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[1] 'Bushnell's Discourses,' *New Englander*, May, 1849, Vol. 7, p. 324.

[2] Leonard Bacon, 'Concerning a Recent Chapter of Ecclesiastical History,' *New Englander*, September, 1879, Vol. 38, p. 708.

[3] 'Dr. Bushnell,' *Nation*, August 19, 1880, Vol. 31, p. 137.

however, interest in Bushnell lies not in the 'dangerous' views which he expressed concerning theology, but in his views of language.[4] These views of language were included in the book, *God in Christ,* in a kind of prefactory explanation entitled, 'Preliminary Dissertation on the Nature of Language as Related to Thought and Spirit.'[5] The function of this dissertation was to indicate the manner in which Bushnell's views of language had influenced his views of contemporary theological dogma. This dissertation was later expanded and more carefully explained in the book, *Christ in Theology*—a book which Bushnell described as 'being the answer of the author before the Hartford Central Association, for the doctrines of the book entitled *God in Christ.*'[6] It is from these two sources that the elements of Bushnell's criticism of language will be abstracted.

The purpose of this paper will be to indicate, by comparing Bushnell's statements with statements taken from *Science and Sanity,* the surprising number of instances in which Bushnell captures the flavor of some of the principles of general semantics as stated by Korzybski.[7]

The following analysis of Bushnell's criticism of language does not invariably follow the order of presentation in the 'Dissertation.' Statements widely separated in the text have been drawn together for the sake of convenience in comparing them with certain principles of general semantics.

A. Premise of Non-identity

Bushnell's fundamental starting point is a premise of non-identity. He says:

> There are no words in the physical department of language that are exact representations of particular physical things . . .To be even still more exact, they represent only certain sensations of sight, touch, taste, smell, hearing—one or all.[8]

In this statement of a negative premise Bushnell shows himself to be aware of the process of abstraction. While he does not distinguish levels of abstraction, he is clearly aware of the misevaluations that may arise when one is unaware of the process. His most telling criticism of the 'logical' method is based upon the fact that, in using it, people tend to omit many aspects of the problem in question. He writes:

> It will also be observed that our mere reasoners and provers in words, in order to get their formulas arrayed for action, always rule out, or clear away, those antagonistic figures, paradoxes, and contrarious representations by means of which only a full and comprehensive expression of the truth is possible.[9]

B. Projection

Having laid down his basic negative premise, Bushnell now asserts that 'words of thought and spirit are not only inexact

[4] The extent to which Bushnell's views of language influenced his theological doctrine would undoubtedly make an interesting and profitable study. Such a task, however, is beyond the scope of this paper.

[5] Horace Bushnell, *God in Christ,* New York: Charles Scribner's Sons, 1903.

[6] Horace Bushnell, *Christ in Theology,* Hartford: Brown and Parsons, 1851. See title page. The references that are made to language in this volume and in *God in Christ* comprise a bulk of more than two hundred pages.

[7] It would be interesting to investigate the sources of Bushnell's views. He mentions having read A. B. Johnson, Richard Baxter, and a man whom he identifies merely as Taylor. The limits of this paper, however, forbids consideration of sources.

[8] *God in Christ,* p. 43.

[9] *Ibid.,* p. 62.

in their significance . . .but they always assert something that is false, or contrary to the truth intended.'[10] This falsification of things he calls 'form.' 'Form' results from the tendency of the mind to give objective existence to that which has no real being. Bushnell explains:

> It is a mere fiction or unreality when I say objectively, 'it is dark,' instead of saying subjectively, 'I am dark,' for this is the real fact—'it is cold,' instead of 'I am cold,'—'it is sweet' instead of 'I have a sense of sweetness'. . . . Language is full of these objective forms of thought, which, though, in one view they have no reality, are yet, in another or more practical, the most profoundly real of all.[11]

Here is what Korzybski says on projection:

> We are using a language that deals with entities *inside our skins* and characteristics entirely non-existent in the outside world. Thus the events outside our skin are neither cold nor warm, green nor red, sweet nor bitter, but these characteristics are manufactured by our nervous system inside our skins.[12]

Although Bushnell recognized the element of falsity that was injected into language by this process, he believed that it was the only way in which 'the human mind could grasp the truth.' He contented himself with warning against it.

C. Intensional Orientation

Bushnell recognized that many people were accustomed to reason merely with words, and that they often did not seem aware that their words failed accurately to represent the truth. He recognizes clearly the misevaluations that such a word-orientation could produce, and he criticizes it in much the same manner that Korzybski was to do later. He writes:

> The truth is given us in forms or images naturally expressive; we take these forms to be the very truths themselves and immediately begin to reason upon them by constructive, or by what is sometimes called though improperly, *à priori* judgements . . . and it is this at which I aimed in the depreciations of logic or the logical method.[13]

It was to this manipulation of words that Bushnell attributed the sterility of speculative philosophy and theology. He says:

> Hence the eternal changes noted in the history of philosophy; which . . . has never yet been able to fix immovably on any one doctrine, and never will be; for the manifest reason, that no one form is so related to any one truth, that another may not be conceived for it which has not some advantages, and will not better accommodate some other speculative system.[14]

Korzybski says on this subject:

> Philosophers and reasoners of that class have had a predilection for intension, and this also explains why, in spite of tremendously acute verbal exercises, they have not produced anything of lasting value, for they were carried away by the structure of the language they used.[15]

Bushnell, in one instance at least, recognized the elementalistic nature of the intensional orientation. This is evident in his argument for the organism-as-a-whole principle.

[10] *Ibid.*, p. 48.
[11] *Christ in Theology*, p. 248.
[12] *Science and Sanity*, p. 384.
[13] *Christ in Theology*, p. 16.
[14] *Ibid.*, p. 85.
[15] *Op. cit.*, p. 180.

> Accordingly, it will ever be found, that in mental science, the investigators are, in fact, only trying to see if they can make up a true man out of some ten or twenty or forty words in the dictionary. The phrenologists claim to have done it, and even to show us the localities of these words in our heads, and how very man-like their word-elements will work when put together . . . And yet there seem to be questions coming after. And probably it will be found, after all, that the only way to make up a real man is to put the whole dictionary into him; and then, most likely, some spaces will be found vacant, some members wanting. It will also be required, that the words be not packed together mechanically in the man, but that they all be alive in him—one living, plastic, organically perfect whole—acting, however, a little mysteriously sometimes, as the life power even of an egg or a bean will presume to do; or what is more confusive to theory, acting diseasedly and contrarily.[16]

And again, he says:

> We look at the whole body as a vital nature, and finding every function alive, every fiber active, we perceive that all the parts, even the minutest, exist and act as mutual conditions one of another.[17]

Compare this with Korzybski, who writes:

> . . . we see that 'emotion' and 'intellect' cannot be divided, that the division structurally violates the organism-as-a-whole generalization . . . Something similiar could be said about the distinction of 'body' versus 'soul,' and other verbal splittings which have hampered sane advance in the understanding of ourself.[18]

D. Multiordinality

When Bushnell talks of the indeterminate nature of words, he approaches the multiordinality formulation. He does not conceive the confusion of meaning as a function of levels of abstraction varying with different contexts. But he does see that many words have an almost infinite variety of meanings. He says:

> The same [lack of agreement as to meaning] as just now intimated is true of hope, fear, love, and other like familiar terms, which we fancy have a meaning so well settled. They have a dictionary meaning that is settled; but yet hope, fear, love is to every man what his own life experience, and his theories, and mental struggles have made it, and he sees it, of necessity, under a color quite peculiar to himself.[19]

This is very much like Korzybski's statement:

> . . . yet we know from experience how words which have one standard definition carry different meanings to, and produce different affective individual reactions on different individuals. Past experience, the knowledge of different individuals are different, and so the *evaluation* (affective) of the term is different.[20]

To Bushnell, as to Korzybski, it is impossible to give a dictionary definition of words that will be adequate. Korzybski says, 'If we enquire about the "meaning" of a word we find that it depends upon the "meaning" of other words used in

[16] *God in Christ*, p. 73.
[17] *Ibid.*, p. 63.
[18] *Op. cit.*, p. 65.
[19] *God in Christ*, p. 47.
[20] *Op. cit.*, p. 22.

defining it,' and if we ask the meaning of the words used in the definition we eventually arrive at 'the undefined terms, which, at a given period, cannot be elucidated any further.'[21] Bushnell notes very much the same thing when he speaks about the 'good writer':

> Having nothing but words in which to give definitions he understands the impossibility of definitions as determinate measures of thought, and gives them only as other forms of the truth in question, by the aid of which it may be more adequately conceived.[22]

Only in mathematics does Bushnell find a language in which the symbolism is free of the inexactness of ordinary language. He says of it:

> In the pure algebraic process, the result is wholly different; because the terms all stand for exact quantities, and the predicates of addition, subtraction, multiplication . . . and the like, are all absolute; so that if the worker goes on to his life's end, producing his changes of formula, he will never come into one that is not true.[23]

On the subject of mathematics, Korzybski states:

> Mathematizing represents a very simple and easy human activity, because it deals with fictitious entities with all particulars included . . . Only and exclusively in mathematics does deduction, if correct, work absolutely.[24]

E. Structure

Nowhere does Bushnell state clearly that language ought to be of a structure similar to the structure of the world. He hints at it, however, in several places. For instance, he writes:

> The only real and true reasoning, on moral subjects, is that which never embarks on words and propositions, but which holds a constant insight of all terms and constructions—'diligently examining the analogy or relation betwixt words and things.'[25]

This quotation indicates a sentiment that Bushnell frequently expressed—that there must be a more exact connection between words and the things they represent. Yet this is not precisely what Korzybski meant by structure. However, Bushnell, in explaining how this more exact connection between word and things was to be achieved, came very close to Korzybski's notion of relation as the only content of knowledge. Bushnell writes:

> There is, however, one hope for mental and religious truth, and their final settlement, which I confess I see but dimly, and can but faintly express, or indicate. It is, that physical science leading the way, setting outward things in their true proportions, opening up their true contents, revealing their genesis and final causes and laws, and weaving all into the unity of a real universe, will so perfect our knowledges and conceptions of them that we can use them in the second department of language, with more exactness. There is, we have also seen, in what we call nature, that is, in its objects, an outward grammar of relations, which constructs the grammar of language; or what is not far different the language of propositions. In the laws of nature, I suppose, there is, in like manner, an internal grammar which is certain, as it is evolved, to pass

[21] *Ibid.*, p. 21.
[22] *God in Christ*, p. 57.
[23] *Ibid.*, p. 60.
[24] *op. cit.*, p. 68f.
[25] *God in Christ*, p. 61.

into language, and be an internal grammar in that, systematizing and steadying its uses.[26]

In considering Bushnell's 'Dissertation,' it is well to keep in mind that he was not attempting a full analysis of language. He sought to show that 'language is, probably, incapable of any such definite and determinate use as we have supposed it to have in our theological speculations; that for this reason, dogma has failed hitherto, and about as certainly will hereafter.'[27] He hoped, in other words, to achieve a more 'friendly and fraternal state than now exists between different families of Christians,' and to convince his contemporaries that religion was a matter not of logic and proof, but of faith.[28]

This is a limited objective. Yet within the scope of it, Bushnell can be said to have perceived accurately not only the need of a methodology of human agreement but also the need of critically evaluating one's unconscious assumptions about language-fact relationships before such a methodology could be evolved. These insights make him, I should say, a true precursor of general semantics.

[26] *Ibid.*, p. 78.
[27] *Ibid.*, p. 92.
[28] *Ibid.*, p. 96.

When the Lord answered from the flaming bush the inquiry of Moses, by saying 'I am that I am,' the answer was wonderfully expressive of the nature of language. . . . We may say to life, What art thou? and to death, What art thou? and we may address a like inquiry to the sun, the earth, the sea, the revolution of the seasons, the alternations of day and night, the fluctuations of the tide, the attraction of magnetism, and the gravitation of stones; but language can furnish them with no better answer than, I am that I am.

ALEXANDER BRYAN JOHNSON, *Treatise on Language*

LOGOS, TELOS, AND PSYCHE:

The Semantics of Value Disorder and Personality Disintegration

HENRY WINTHROP*

I. Prologue and Problem

Ours is said to be an age in which neuroses, psychoses and minor maladjustments are more prevalent than ever before. All maladjustments, whether major or minor, are essentially responses which are irrelevant for the dissipation of the problem for which they were intended, or responses which are entirely disproportionate to the stimuli which evoked them. In simple environments, such as that represented by an agrarian economy which at most burdens the individual with routine social and domestic chores within the capacities of even the village moron, human beings had to respond to stimuli almost wholly of a non-verbal nature. In complex, sociotechnical milieus, however, such as the urban areas of the Western world today and to some extent also non-urban areas and regions, the stimuli to which the individual must attend are almost wholly verbal. Where participation by the citizenry in the handling of the collective affairs of the community is called for, the tasks which the average individual must face, the problems towards whose solution he must contribute and the interpersonal adjustments he must achieve, require, to a degree never demanded before, a high order of intelligence and a capacity to manipulate the environment by means of language. Thus in a sociotechnical culture which becomes more complex with each passing day and in which institutional relationships and focal problems can no longer be understood without an adequate semantic grasp of one's environment, modern man has had to become a specialist in the technique of responding properly to complex nests of institutional stimuli, these responses being almost exclusively to symbols, words and meanings. Most of the complex, institutional nexus of our time and most of the choice situations demanding social action involve essentially problems in the analysis of meaning rather than alignments with one or another type of preestablished institutional pattern. Unfortunately few are aware of this or equipped to cope with the socioepistemic problems which modern man has generated for himself. Few have foreseen the consequences to which the institutional artifacts of his own creation could give rise. For these reasons the average man or woman today runs semantically amok (and sometimes literally so) in relation to the problems and choices to be faced like a laboratory rat with an experimentally induced neurosis.

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The chief way in which modern man can make an appropriate response to his complex situation is through the semantically healthy use of language in relation to social interdependencies and interpersonal equilibria as these are abstracted at different levels of ordinality from external nests of convergent, sociolinguistic stimuli. Failure to do so accounts in large measure for neuroses, psychoses and gross maladjustments in otherwise intelligent individuals. Failure to achieve semantic health in our modern sociotechnical milieus also produces cynics, intellectual eremites, literary escapists, cranks and faddists, ideologues, and a thousand and one organizations devoted to some absurd *idée fixe* or other. We live, as Toynbee puts it, in a 'time of troubles,' most of which can be accounted for by a type of neurological rigidity which afflicts multitudes. These neurological rigidities, of course, exhibit themselves as faulty semantic responses to linguistic stimuli, and in their train come faulty adjustment to psychological and social symbols. Maladjustments of this type constitute first-order maladjustments.

Second-order maladjustments occur, however, which, though less important *socially* than modern man's collective failure to respond appropriately to external nests of convergent, sociolinguistic stimuli, are more important *psychologically* in their power to generate tension and conflict. These second-order maladjustments lie in the realm of the structure of attitudes. Individuals will develop personal attitudes which are more or less permanent psychological matrices for dealing with values (choices) and frequently these attitudinal matrices are completely incompatible *in a logical sense*. Quite obviously the individual who actually tries *to act* upon incompatible attitudinal matrices, that is, incompatible evaluating contexts, for the same external problem-situation, will tear himself apart psychologically, even if one of the attitudinal matrices should represent or generate a response which can dissipate the problem-situation itself. For in a second-order maladjustment we do not refer to the lack of complementarity and fulfillment between a response and a sociolinguistic stimulus but to the internal conflict or tension which result from incompatible evaluating matrices of equal strength in the responding subject. This psychological conflict and tension may even be generated from evaluative activity expended upon *temporally successive* problem situations which have identical meaning status for the responding subject but to which each of two incompatible attitudes have been applied successively. In general the inability to order one's values in such a way that logical consistency will obtain among the propositional designations of these values represents a failure in 'personal integration.' A high degree of such inconsistency or 'disintegration' is, we suspect, productive of neuroses and psychoses which are *truly functional in nature* and which are unaccompanied by any type of psychometric deterioration.

In the clinical concept of 'disintegration' we are concerned by contrast with the diminution, impairment or loss in the ability to abstract and generalize which is so frequently seen in 'dead-level' abstracting. In the literature this situation is referred to as the loss of the 'categorical attitude' and represents a *failure to order meanings and sensory stimuli,* rather than a *failure to order values*. The loss of the ability to order meanings and sensory stimuli may be detected and measured by a host of clinical devices such as zuordnungstests, the Rorschach test, and other types of projective technique and

thematic apperception tests, and has been studied by Goldstein, Hanfmann, Cameron and many others. This loss in the power to abstract and generalize is what occurs essentially in the true psychoses, such as schizophrenia. With this loss in the power to order and classify meanings and sensory stimuli we are not here concerned.

With the loss or failure in *the power to order one's values,* which may occur without any intellectual deterioration whatsoever, we are most deeply concerned as semanticists. The problem of and the technique for measuring failure in the capacity to order values (telic disintegration) will require an approach and a methodology drastically different from the devices used to measure 'personality disintegration' in the clinician's sense of the term. We cannot avoid devoting our attention and time to telic disintegration and to the determination of which particular attitudinal matrices cause modern man maximum trouble in adjustment. Attitude-incompatibility or inconsistency can and does occur even for subjects of enviable psychometric status. As second-order maladjustments responsible for psychological conflict and tension, telic disintegrations are dangerous both for the individual and for those of his neighbors with whom he comes into contact.

As semanticists we cannot help being interested in measures of value-ordering failure for *at least* five important reasons: (1) telic-ordering failures are *almost wholly* semantic in origin; (2) they are measurable rigorously so that such measures may be correlated with other significant measures of human behavior for prognostic and therapeutic purposes; (3) they serve as a matrix for quantifying for the first time a *functional,* psychological *concept of conflict;* (4) they may in principle be correlated with or subsumable under a theory of neurological flexibility (or rigidity) in relation to language behavior; and (5) they make possible a clinical instrument for quantifying conflict without the intervention of the psychoanalyst, or to put the matter more reasonably, they add to the skills, wisdom and knowledge of the psychotherapist by putting into his hands an objective complement of the talking-out technique. The psychoanalytic talking-out technique, where properly conducted, discloses to the imaginative and experienced operator, the verbalized reflections of conflicts which interfere with the individual's capacity to knit his life-goals into a unified, coherent pattern. The most conclusive evidence of conflict which a good operator can gather from a patient is marked attitude-inconsistency. The method outlined in this paper represents an attempt to develop a psychodiagnostic instrument to detect such conflict in the area of responses to institutional stimuli.

The domain of value-ordering in the *logical* sense of order and its *psychological* corollary of *absence of conflict* is today a completely neglected terrain. This neglect is almost criminal, for as democracy enters its 'time of troubles' and demands more than ever the participation of its citizens, any failure to ascertain the extent to which the clinically 'normal' citizen grasps the complex sociolinguistic and telic issues of his institutional environment will be costly to the body politic. Never before in human history have so many people failed to grasp so much, and never before has this failure augured so badly for the community. Never before has community leadership tried to save so many with so little in so short a time as is now available and with so little understanding of what is semantically required. No democracy can function if it makes no effort either to

find out how much of the community's problems are at the grasp of the average man, if it makes no effort to discover what contradictory tendencies against democratic clarity of action and individual wholeness are present in the average citizen, and if it makes little or no effort to undertake a varied program of adult education by all means available, in order to straighten out the attitudinal incompatibilities, that is, the value-disintegrations which are so widespread today.

Any measure of telic disintegration which can be developed will have at least two major functions. First, to reveal the major areas of first-order maladjustment with respect to different modes of convergent, sociolinguistic stimuli; second, to reveal the typical degree of non-clinical second-order maladjustment in the general population and the demographic range of value-ordering failure. An instrument for the measure of telic disintegration may also suggest possible avenues of reeducation for and re-ordering of values along semantic lines, which may modestly play its small part in the development and success of 'participant democracy,' in this 'time of crisis.' Measures obtained by such an instrument on a representative sample of any given type of population will have as its immediate significance and utility a picture of the extent of the ravages of *non-clinical personality disintegration in the domain of values* and thereby in the area of sociolinguistic maladjustment. The problem to which this writer addressed himself some time back was precisely the development of an instrument for the study of non-clinical personality disintegration[1] which would subserve the semantic objectives outlined above and its application to an elite population (a university population) in order to see what degree of value-ordering was present in the more semantically sophisticated of the United States of America. The instrument which was finally used gave, strictly speaking, *an index of attitude-consistency* which, in effect, constitutes an operational definition of non-clinical personality disintegration. The instrument as originally developed now requires improvement and revision, a task which the writer hopes to undertake some time in the future. Readers of *ETC.* may be specifically interested in (1) how such a test is developed (its underlying methodology makes it easy to produce multiple equivalent forms) and (2) what the initial findings were like with its use. To satisfy the curiosity aroused by these two considerations is the purpose of the next two sections.

II. The Methodology

The Serbonian bog of values into which modern man has plunged himself through semantic maladjustments can be studied if we assume that human beings will be honest enough in a pencil-and-paper situation to reveal felt attitudes. By making use of the Aristotelian Diagram of Opposition, now more than 2,000 years old, and familiar to college students in courses devoted to formal logic, we have a clear-cut instrument for

[1] Although, in the sense in which we employ this term, we recognize that extreme degrees of clinical disintegration (loss of the categorical attitude) must always produce telic disintegration, the reverse causal relationship is not mandatory. In general a population characterized by excessive telic disintegration will show individuals who do not necessarily become neurotic or psychotic and others for whom long continued telic disintegration *will produce* functional neurosis and psychosis. The problem of when and why value-disintegration passes over into a functional neurosis or psychosis will have to be settled by future research along the lines discussed in Section II which follows.

the detection of attitudinal compatibility or incompatibility. In the Aristotelian Diagram of Opposition there are four basic types of proposition:

SYMBOLIC DESIGNATION	ABBREVIATION
All S is P	'A Proposition'
No S is P	'E Proposition'
Some S is P	'I Proposition'
Some S is not P	'O Proposition'

These are arranged around the four corners of a square, the A at the upper left-hand corner, the E at the upper right-hand corner, the I at the lower left-hand corner and the O at the lower right-hand corner. The diagonals of such a square connect propositions which are called 'contradictories,' such as the A-O and the E-I. The upper base connects propositions which are called 'contraries,' such as the A-E; the lower base connects propositions which are called 'subcontraries,' such as the I-O. The two sides of the square connects propositions which are in the relation of principle (A) to subaltern (I), or principle (E) to subaltern (O). The synoptic, logical relationships which the Square of Opposition gives, are, in brief, set forth in the following paragraph.

Such a diagram expresses the compatibilities or incompatibilities among the four propositions. Thus:

(1) If one of a pair of contradictories is true, the other is false, and vice versa.

(2) Two contraries cannot be true but both contraries may be false.

(3) If a principle is true a subaltern is true but not vice versa.

(4) If a principle is false the subaltern is indeterminate.[2]

[2] See also Avey, Albert E., *The Function and Forms of Thought*, 1927, pp. 175-6.

The more important of the relationships of the Square of Opposition, for our purposes, are those of logical contradiction and logical contrariety, and, in addition, one not shown in the square, namely, that of logical equivalence.[3] One cannot assent to an A and O judgment simultaneously or an E and I, and make sense intellectually. The same is true for the A-E, although one may deny both and make sense. We now extend these principles to attitudinal sentences of an optative, hortatory or conative nature,[4] as in the following illustrations:

A. I believe all radicals should be deprived of democratic rights and privileges.

O. I believe some radicals should not be deprived of democratic rights and privileges.

A. All Europeans want to depend upon Uncle Sam in order to stabilize themselves economically.

O. Some Europeans want to get on their own feet economically without the help of Uncle Sam.

We are then in a position to assert that any subject giving assent to such attitudinal contradictories or inconsistencies and intending to act upon them is or will be in a state of psychological conflict or tension. If such attitude-consistency is low for any subject over a large sample of various attitudes of different value (choice) referents concerned with prospective behavior in diverse domains

[3] Two sentences are logically equivalent when they have the same subject (not subject name) and predicate (not predicate name) and the same quality and quantity, but are grammatically different.

[4] That this extension may legitimately be made has been shown in a monograph which will appear as two separate articles in the *J. General Psychology*, sometime in the future.

of adjustment, then it is an indication of extensive *psychological conflict* or *personality disintegration,* where by this latter concept we have reference to the failure to order values rather than the clinical concept of the failure to order meanings and sensory stimuli.[5] Conversely a high degree of attitude-consistency would represent substantial, coherent organization of the personality with stable patterns of motivation and with the capacity to order values. Extensive attitude-consistency will imply second-order maladjustments of negligible degree, that is, little indecisiveness and low attitudinal tension regarding the subject in question.

In order then to measure 'personality integration' we must develop a test of attitude-consistency based upon the extension of the logical principles of contradiction, contrariety and equivalence into the telic domain, and which will be so diversified referentially that no tychistic clumping of consistency or inconsistency on certain sociolinguistic referents will prejudice the total picture. Such a test was developed by the author and is described below.

One hundred attitudinal referents out of about three hundred were selected for test purposes. For each of these attitudinal referents two attitude-sentences, similar in nature to examples I and II, were constructed, which stood to each other in the relationship of logical contradiction, contrariety or equivalence.[6] However, since individuals do not express their attitudes in the stark and bloodless propositional form of the aristotelian logic, but in a context of social discussion in which the attitudes occur embedded among more or less irrelevant verbalisms, each half-item of an attitude pair was constructed so as to hew as closely as possible to the manner and dressing in which it would appear in the context of social discussion, thus removing the artificiality of naked logical form in which human beings do not ordinarily express themselves. This procedure is, of course, the most difficult feature of such a test, for in the effort to avoid the nakedness of logical structure on the one hand and the *specific determinants* and *misleading cues* of the verbal dressing on the other, we may overreach our original psychometric intention to test exclusively for prospective behavior with respect to *one particular attitudinal referent.*[7]

One member of each attitude-pair was selected for inclusion in one test sheet, the other for inclusion in a second test sheet. Both test sheets of 100 items constituted finished units, each test sheet being disguised as an opinion questionnaire, on which certain personal data about each testee was solicited. An experimental elite population of about 250 subjects (graduate and undergraduate students at a large university) was then selected. This population was given each

[5] For the precise sense of what is meant by the failure to order 'meanings and sensory stimuli' see the general literature or the writings of the Gestaltists (Kurt Goldstein, Cameron, Hanfmann, Kasanin, Vigotsky, Angyal, *et al.)* on the use of zuordnungstests for the detection of clinical 'personality disintegration.'

[6] The method of test construction, the technique of determining test validation and reliability, and the method of scoring, are fully described in the original publication entitled 'Semantic Factors In The Measurement Of Personality Integration,' *J. Social Psychology,* November, 1946.

[7] A substantial group of judges was employed to select those attitude-pairs which not only exemplified one or another of the three logical relationships mentioned but which also seemed most close in appearance to the natural social context of discussion in which they would appear and which seemed least likely to make the reader miss the attitude-referent at which the pair aimed.

of the test sheets about two weeks apart. This period was regarded as long enough to *prevent* testing for logical ability (in which we were not interested) and short enough to involve little or no change of attitude. Furthermore, the administration of the second test sheet was unanticipated, so that a two-week period plus the scrambling up of the serial order of the half-items of the second test sheet, so as not to correspond with the serial order of appearance of the corresponding half-item on the first test sheet, prevented memory from playing any significant role. For each experimental subject the two test sheets were then brought together, the two items of each attitude-pair were scored for the presence or absence of logical consistency, that is, attitudinal compatibility. The *number consistent* over the *total number of attitude-pairs responded to* yielded an *operational index of attitude-consistency* for each experimental subject. This universe of attitude-consistency indices, analyzed and treated statistically, gave the findings discussed in the next section.

III. Experimental Findings

It is a startling consideration to find that the average index of attitude-consistency for an elite population is 47, where 100 is the maximum score possible. This is equivalent to asserting that more than one-quarter of our attitudes are in conflict with another quarter; or to state the matter in another way, we may say that the chances are a little better than even that we will demonstrate second-order maladjustment towards any particular problem selected at random. If consistency of attitudes is not greater than this for an elite university population how much less sanguine must the picture be for the general population? It is even more startling and incredible to note that about 15 per cent of an elite group obtained a score equal to or less than a chance score of 33. This substantial fraction of a stratified sample achieves second-order adjustment which is *not as good as that which could be obtained by a mechanical robot* which was so constructed that it could respond to the 200 separate half-items of the test, if these had been scattered at random over a key board, by pressing down *at random* under electrical stimulation, let us say, various levers which controlled a 'Yes,' 'No,' or '?' response to each such half-item.[8] One wonders if the semantic confusions which assail modern man through propaganda and other devices do not have negative value in that, instead of leaving him with a constant unimproving degree of 'personality integration,' they actually make for increasing telic disintegration.

The range of attitude-consistency or telic disintegration ran from an index of 17 to one of 72, with 68 per cent of our experimental population falling between scores of 35 and 59, a range of 24 index points, roughly one quarter of the total range. Ninety per cent of the population fell below an index of 62 which was not even twice as large as the *chance score of 33*. Thus, it becomes perfectly clear that even in an intellectually elite population, non-clinical personality integration is extremely poor. The original frequency distribution of the scores showed that attitude-consistency is one of those rare psychological aspects of the human personality which *is not normally distributed*. An interesting result which came to light was the upsetting of a forecast by

[8] Testees could respond in one of three ways on the original test; by giving assent (yes), by repudiation of the attitude (no) and by suspending judgment (?), where no attitude-crystalization had taken place.

professional colleagues that 'since women do not know their own minds' *(sic)* a substantial difference in the mean score of the two sexes would be found. From every statistical standpoint conceivable the ladies did exactly as well as or as poorly as the men, thus dissipating still one more pious masculine hope of anticipated male superiority.

On the encouraging side was the fact that of 31 subgroups into which the experimental population was divided, the highest average score (52) was found among those students (151, a reliable sample) who describe themselves as not only concerned about social (institutional) issues but also as doing extensive reading on these. This not only suggests that the capacity for attitudinal integration is dependent to some extent upon educational factors, but also suggests that a semantically organized regulation of these educational factors may be able to make for a considerable increase in second-order adjustment. Fitting in with this interpretation is the fact that the lowest average score (40) was found among those students who described themselves as *unconcerned* about social issues but who read up on them. Apart from the fact that this last claim is probably an ideal projection, the sample itself was too small (15) to be reliable numerically, but can probably be trusted as an *indication of a tendency*. Significant statistical differences were found between the average scores of extensive readers and less-than-average readers and between readers concerned with social issues as against readers (?) unconcerned. Finally, for readers who take their current politics of Tweedledum and Tweedledee very seriously we must report no *statistical difference* whatsoever between the personality integration of the elephant and the ass.

IV. Semantic Blockages and Attitude-Consistency

Although the author feels that the factors making for poor telic integration are chiefly semantic in nature, let us briefly pay our respects to non-semantic factors which may be responsible for low attitude-consistency, before touching upon the semantic ones. These, which we mention only in passing, might include lack of relevant information about an attitudinal referent, poor intelligence, a feeble memory for printed material immediately after it has been read, and possibly others. The genesis of the *semantic blockages,* themselves, however, which make for extensive attitude-inconsistency, are multiple in nature.

The theory of semantic blockages, *as we are using the phrase,* is concerned with the phenomenon of human conflict in behavior, either intrapersonal or interpersonal. A good portion of such conflict is assumed to be due to linguistic causes, that is, to improper manipulation, in using or listening to speech, of the verbal aspects of the environment. This improper manipulation is assumed to be largely due to inappropriate connections made by individuals between language (words, phrases, and other larger units) and the environment to which it *should* have reference, directly or indirectly. This improper manipulation is assumed to be due to the confusion of what are called 'levels of abstraction.'[9] This con-

[9] The levels of abstraction have been appropriately delineated by a diagrammatic device which Korzybski calls the 'structural differential.' This is a diagram which is intended to refer to the structure of 'reality' in all of its non-verbal and verbal aspects. The nature of this diagram, however, can be described in words. The most fundamental structure of 'reality' is the submicroscopic level which is never experienced, that is, 'process' as a perpetual change in the physical and chemical

fusion, sometimes referred to by Korzybski and his school as 'extensional errors,' is supposed to result in inappropriate responses on the behavioral level, non-sensical responses on the verbal level, and inconsistent responses on the attitudinal level. These 'extensional errors' are what are here designated as 'semantic blockages' and which we assume account in large measure for attitude-inconsistency and its concomitant personality disintegration.

The genesis of semantic blockages, however, is multiple in nature. We feel that some of the varied causes which may produce semantic blockages have operated to produce the attitude-inconsistency found in our experiment. The first of these is the lack of a sense of logic by which a subject would be distinctly helped in the ordering of his values, even though the test, itself, *does not measure the capacity for logical order.* A second important factor is the fact that individuals do not know the usual meanings of words. A good example of this is the use of the word 'intelligence' which occurred in several attitude-pairs. Most individuals attach different and vague meanings to this term and even the same individual will attach different subjective associations to it. If we use the nomenclature of Korzybski's school, the 'extensional' focus of this word is a score on an intelligence test, arrived at by a series of standard operations described in the literature of psychometrics. Most people use the word so that it refers to different aspects of human behavior, having nothing in common with the operational definition of intelligence. Even more confusing is the fact that for the same individual the word will refer to different characteristics of any one individual in different situations. Where the psychological imagery of the testee is subject to this latter habit, incompatibility in attitudes will be easily generated.

A third factor making for inconsistency may be described as the Principle of Verbal Irradiation and, were it necessary, could be explained on strict behavioristic grounds using stimulus-response schema. The principle applies to phenomena of the following sort. A testee forms a judgment about *A* (a Jew, a Socialist, etc.) and unconsciously extends it to the class of which *A* is a member. In the test-situation the testee uncritically responds to the *A* or *E* proposition. When faced with the *I* or *O* proposition, however, a critical response is suggested by these particular, logical forms and the response is now extensionally judicious, but not compatible with the earlier, uncritical response.

A fourth type of difficulty consists of

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characteristics of 'atomistic' entities. The next level of reality is the level of sense experience which refers to qualities of segments of reality, which are 'abstracted' from the totality of impressions reaching the sentient organism. The 'experience' achieved at this level is described as an emergent from the interaction between the nervous system and physico-chemical stimuli of various kinds. These two levels of reality are *non-verbal* in nature. The next emergent level is verbal and refers to the names or simple descriptive statements we employ to bring the focus of attention to experiences at the second level, the level of non-verbal, neuromuscular, macroscopic experience. The level of abstraction even further removed from this third level is the level on which we make statements about labels or descriptions on the third level. The next level of abstraction would obviously be one on which we make statements about statements (sentences, propositions) on the fourth level. Clearly this 'abstracting process' is subject to infinite regression, which has been recognized in modern logic in the concept of metalanguage. The failure to discriminate 'levels of abstraction' is theoretically assumed to be *one* factor making for attitude-inconsistency and personality disintegration.

the inability of some people to understand long sentences or those containing two or more abstract terms. A fifth stumbling block may be described as the failure to see the relationship between genus and species. Thus the following pair of attitude-sentences will bring out our point:

> A. All forms of government are designed to serve human ends.
>
> O. The *communist* form of government is not designed to serve human ends.

Failure to discriminate between the precise meaning of *A*, applied to all forms of government, and the independent question of whether a particular political structure fulfills the end for which it was designed, would make for attitude-inconsistency in this case. *A* obviously refers to group intent and not to the results of group intent.

A sixth semantic failure upon the part of testees is their *animalistic reactions to words*. By this we have in mind the easy habit of individuals, through constant reinforcement, to respond to sociolinguistic stimuli expressively rather than ratiocinatively. Testees who respond first expressively to the terms of an attitude-sentence and then rationally to the same terms in the logical contradictory or contrary are likely to roll up quite a high attitude-inconsistency score. Difficulty number seven is somewhat related to number six. It is the *subjective error*. Testees will frequently attach subjective, unconventional meanings to words and phrases, though these individualistic interpretations need not be *expressive* in nature. These will vary in time and in context for the same individaul, making for extensive second-order maladjustment. Finally *attitudinal ambivalence* may increase the incidence of attitude-inconsistency. Subjects may respond favorably to an A for one set of reasons and to an O for another. Such ambivalence should, of course, lead to a denial of the A or E form of the attitudinal matrix. However, a subject may accept an A thoughtlessly and subsequently the O is accepted, even if, at that time, the subject can see that the A should have been rejected.

These semantic considerations are probably only a small sample of those which come into play in the formation of second-order maladjustment. They are surely, however, among the major factors. Workers in general semantics will undoubtedly be able to isolate other types of semantic blockage in experimental work along similar lines in the near future. When we have a clearer picture of all the factors, both semantic and non-semantic, which make for widespread personality disintegration, then and only then shall we be ready, as semanticists, to propose proper reeducational and rehabilitative psychotherapy along chiefly semantic lines, with the express purpose of enabling that segment of humanity which takes its interpersonal and institutional relationships seriously, to make the most appropriate adjustments to social issues and personal problems.

IV. Conclusions

Since the writer's original experiment was conducted several agencies and individuals have expressed an interest in the work as such or in carrying it forward. However, semantic research on personality integration requires attack on several fronts in the future. Among these are the following needs: (1) an increased number of improved and standardized pairs of attitude-sentences relating to all sorts

of interpersonal and institutionally significant value-referents, so that a pool of interchangeable items for the construction of a variety of multiple forms of an attitude-consistency test may exist; (2) tests of extensional, telic analysis, that is, psychometric devices which will test the degree to which subjects comprehend the value-referents to which an attitudinal matrix refers; (3) a statistical analysis of the areas of nodal inconsistency for sociolinguistic responses and the reasons for these; (4) an analysis of the thought patterns and a classification of the semantic confusions which occur in extensive second-order maladjustments; (5) a determination of correlations, if any, between scores on zuordnungstests, thematic apperception tests, and tests of neuroticism on the one hand, and attitude-consistency tests on the other, both for the general population and important stratified samples drawn therefrom; (6) a determination of correlations between tests of vertical attitude-consistency (attitudinal rigidity over long periods of time despite changing extensional foci) and horizontal, that is, telic attitude-consistency for any given short period (say two weeks) of time; (7) the development of attitude-consistency tests of such a nature that subjects asked to write on certain themes will reveal the inconsistency of their attitudes, these themes having been selected thoughtfully by a method which is guaranteed to reveal telic disintegration, if present; (8) a factor analysis of the personality traits and intellectual traits correlated with low and high indices of attitude-consistency, which may reveal psychic structures predisposing the individual to semantic pathology and (9) the effect of indecisiveness on attitude-inconsistency.[10]

The area of research invited by telic disintegration is vast, particularly today. Here it seems to me is a domain in which semanticists have a function peculiarly cut out for them and one in which they have an important contribution to make. Little time should be lost in widening the horizon of our knowledge in this area, for the capacity to order his values into a matrix of psychological and logical compatibility, in relation to nests of convergent social stimuli by appropriate linguistic responses, is probably the most important collective task facing modern man, a task whose importance neither the rhetorical thrusts of a Dunham nor the tiresome pleonasms of the anti-semanticists can lessen. Insofar as the crises of our time are in large measure related to this failure to order values, the discipline of semantics may yet prove to be the major therapy in the task of the psychological rehabilitation and social reconstruction of modern man.

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[10] This phenomenon is directly measurable with a test of attitude-consistency which allows for three possible responses, 'Yes,' 'No,' or '?,' the latter to be used where the subject has not crystallized his values towards the referent in question. Where this is really the case the two attitude-sentences (contradictories or contraries) will be responded to with a pair of question marks. We assume that indecisiveness is represented by any combination of a question mark with either a 'Yes' or 'No,' such a combination, of course, being scored as inconsistent. Then an operational definition of *the force of indecisiveness on attitude-inconsistency* will be given by the ratio of the number of inconsistent items consisting of the combination response of a question mark with either a 'Yes' or a 'No,' to the total number of inconsistent items. This amounted to 37 per cent for a sample of our experimental population, showing how much of psychological conflict and tension is due, not to floundering between contradictory attitudes but to uncertainty as to what value-referent to give assent to in the first place.

✡ DISCUSSION ✡

PROBABILITY AS A GUIDE IN LIFE

RUDOLF CARNAP[1]

MANY philosophers are of the opinion —and I agree with them—that the concept of probability is of importance not only from a theoretical point of view but also in practice: it serves as a guide in life. We can never obtain certainty in predictions of future events but at best some measure of probability. We form our expectations of future events in accordance with their probabilities on the basis of the observations made so far, and these expectations influence our decisions.

It seems to me that there are *two* concepts of probability, two different meanings in which the word 'probability' is commonly used.[2] Suppose a physicist ascribes the value 0.03 to the probability that the kinetic energy of a molecule in a given body of hydrogen lies within a certain interval. This means that 3 per cent of the molecules are in such a state of energy. In this case 'probability' means as much as 'relative frequency in the whole population.' On the other hand, if a scientist says that on the basis of such and such observations one hypothesis is more probable than another, he means to say that it is more strongly supported or confirmed by the given evidence. Thus 'probability' here means 'degree of confirmation.' Let us use the term 'probability$_1$' for this concept, and 'probability$_2$' for the frequency concept. I believe that it is possible to define a *quantitative* concept of probability$_1$ so that it would be possible to make statements of the form 'the degree of confirmation of the hypothesis h with respect to the evidence e is so and so much,' specifying a numerical value. Statements of this kind express a purely logical relation between the sentences h and e, analogous to, though

[1] Professor of Philosophy, University of Chicago; author, *Abriss der Logistik* (1929), *Logische Syntax der Sprache* (1934, published in English in 1937 as *The Logical Syntax of Language*), *Philosophy and Logical Syntax* (1935), *Foundations of Logic and Mathematics* (1939), *Introduction to Semantics* (1942), *Formalization of Logic* (1943), *Meaning and Necessity: A Study in Semantics and Modal Logic* (1947). Dr. Carnap's paper is reprinted with his permission and that of the editors from *Journal of Philosophy*, Vol. XLIV, No. 6 (March 13, 1947). It was originally read (without the footnotes) at a meeting of the American Philosophical Association, Western Division, at Chicago on May 9, 1946.

[2] The distinction of the two concepts and the nature of inductive logic are discussed in 'The Two Concepts of Probability,' *Philosophy and Phenomenological Research*, Vol. V (1945), pp. 513-532, and 'Remarks on Induction and Truth,' *ibid.*, Vol. VI (1946), pp. 590-602.

different from, statements of logical implication. While the latter statements constitute deductive logic, the former statements, in my conception, constitute *inductive logic*.[3]

Since there are those two different concepts of probability, we have to study the question as to which of them can serve as a guide in life. It will be the aim of this paper to show that this holds for the concept of probability$_1$, that is, degree of confirmation. Others deny this, in particular those who want to restrict the theory of probability to probability$_2$, that is, frequency. They believe that only the concept of probability$_2$ can be of help in making practical decisions because only a statement on probability$_2$ says something about the facts of nature. A statement on probability$_1$, on the other hand, is purely logical; if it is true, it is logically true, analytic; it does not say anything about facts. All of us agree in this characterization. But those philosophers draw from it the conclusion that a statement on probability$_1$ can not serve as a basis for our decisions, and hence can not be regarded as a genuine probability statement. It is this objection to the concept of probability$_1$, the denial of its applicability and usefulness for practical purposes, that I want to discuss.

The distinction between the two kinds of probability statements is, I believe, a special case of a more general distinction between two kinds of statements, a distinction which is important for the methodology of empirical science but has not so far been sufficiently analyzed and clarified. This is the distinction between (1) a statement about the actual value of a physical magnitude in a given case, a value which is either unknown to the observer or at least not known exactly, and (2) a statement about the *best estimate* of this value with respect to given evidence, which may, for instance, include the results of some measurements made by the observer. Suppose the observer has measured the length of a given rod three times, with the results, say, 80.0, 80.1, 80.5. Let us assume that the measurements were made under the same conditions. Then there is no reason for regarding any one of the three results as more reliable than any other. Therefore the observer will take as an estimate of the length of the rod the arithmetic mean of the three values, that is, 80.2. He can not assert with certainty that the actual length is 80.2 (not even if this figure is understood as an abbreviated expression for the interval 80.15 to 80.25). The value 80.2 is merely an estimate; that means, it is a guess; not an arbitrary guess but a sensible guess. It is indeed the best guess the observer can make in the present situation, as long as no results of further measurements are available to him. (For the sake of simplicity, I omit here a reference to the standard deviation, which would serve as a measure for the precision or the reliability of the estimated value.) Now let us compare the following two sentences which occur in this example:

(1) The actual length of the rod is 80.2. $l(a) = 80.2$.

(2) The best estimate of the length of the rod with respect to the given evidence e is 80.2. $l'(a,e) = 80.2$.

(The evidence e is here the statement of the three observed values 80.0, 80.1, and 80.5.)

[3] A tentative definition for a quantitative concept of degree of confirmation with respect to a simple language system and a few theorems of inductive logic based on the definition have been given in 'On Inductive Logic,' *Philosophy of Science*, Vol. 12 (1945), pp.72-97. References in subsequent footnotes are to this paper.

The first of these two sentences is an empirical sentence, one with factual content. (We need not discuss in detail the problem of its exact interpretation; it may be interpreted, for example, as saying that the arithmetic mean of the results of the first n measurements would, with increasing n, converge towards 80.2.) The second sentence, on the other hand, is analytic. It is based upon the definition of 'the best estimate.' We may assume that this definition is constructed in such a manner that it implies that, for simple cases like the one under discussion, the best estimate is the mean of the observed values. The sentence (2) can not be either confirmed or disconfirmed by any future observations. Even if the results of future measurements tend towards a value considerably different from 80.2, it still remains true that 80.2 is the best estimate *with respect to the evidence* consisting of the three values stated earlier.

Let us suppose that the observer has to make a practical decision concerning the use of a given rod, a decision which depends upon the length of the rod. Then he proceeds, of course, as follows: he acts in certain respects as though he knew that the length was 80.2. Now let us analyze the theoretical basis of this behavior. I do not mean here the psychological question as to the actual process by which the observer arrives at this decision, but rather a rational reconstruction of this process. Which of the two sentences (1) or (2) may serve as a rational basis for the decision? We might be tempted to say that this must be the sentence (1). However, this sentence lies outside of the domain of the observer's knowledge at the present moment, that is to say, this sentence is not highly confirmed on the basis of his evidence.[4] Still less does he know whether future observations will highly confirm it and hence suggest its acceptance or highly disconfirm it and hence suggest its rejection. Therefore the observer can not find a theoretical basis for his decision in sentence (1). But he finds it in sentence (2), because this sentence, added to the evidence available, supplies the value 80.2 which determines his decision. On the basis of his observations, he possesses the evidence consisting of the three values 80.0, 80.1, and 80.5. Then the sentence (2) tells him that, with respect to this evidence, the value 80.2 is the best estimate he can make. And this result determines his decision.

II

Generally speaking, situations of this kind may be characterized as follows. Practical decisions of a man are often dependent upon values of certain magnitudes for the things in his environment. Since he does not know the exact value, he has to base his decision on an estimate. This estimate is given in a statement of the form: 'The best estimate for the magnitude in question with respect to such and such observational results is so and so.' This statement is purely analytic. Nevertheless it may serve as a basis for the decision. It can not, of course, do so by itself, since it has no factual content; but it may do so in combination with the observational results to which it refers.

Now let us return to the problem of the concept of probability$_1$, that is, degree of confirmation. It seems to me that the situation here is to some extent analogous to that in the example just discussed. Suppose that a sample of eighty persons has been selected at random from the

[4] The probability$_1$ on the evidence e for the assumption that the actual length is exactly 80.2 is 0; the probability$_1$ for the assumption that the actual length is between 80.15 and 80.25 is considerably lower than $\frac{1}{2}$.

population of Chicago and sixty of these persons have been found to possess a property M. This constitutes the present evidence e. Let h be a singular hypothesis, namely, the prediction that one person taken at random from the nonobserved part of the population will be found to have the property M. If a definition for the degree of confirmation c has been constructed, the value of $c(h,e)$ can be established, that is, of the degree of confirmation for the hypothesis h just mentioned with respect to the evidence e concerning the sample of eighty individuals. For our discussion the actual value of c is irrelevant. It may be remarked incidentally that, for plausible definitions of c, the value in this case will be equal or near to the relative frequency of M in the observed sample, which was ¾. To make the example more concrete, let us arbitrarily assume that $c(h,e)=0.73$.[8] If a suitable general definition D for the concept of the best estimate in terms of degree of confirmation is laid down, then a theorem T can be proved which says that this estimate in cases of the kind described always has the same value as $c(h,e)$. Applied to our example, T says that the best estimate of the relative frequency of M in the whole population of Chicago with respect to the evidence e has the same value as $c(h,e)$. We have assumed that $c(h,e) = 0.73$. Therefore the best estimate of the relative frequency in the whole population is likewise 0.73, hence close to the relative frequency observed in the sample, which seems plausible. Now let us compare two sentences concerning the present example; they are analogous to the earlier sentences concerning the actual length of a rod and the estimate of its length.

(1) The actual relative frequency of M in the population of Chicago is 0.73.
$fr\ (M,C) = 0.73.$

(2) a. The degree of confirmation for the singular hypothesis h with respect to the evidence e concerning the observed sample is 0.73.
$c(h,e) = 0.73.$

According to the theorem T, this sentence is logically equivalent to the following:

b. The best estimate of the relative frequency of M in the whole population with respect to the evidence e is 0.73.
$fr'(M,C,e) = 0.73.$

(Note, by the way, that the theorem T which connects (2a) with (2b) throws some light on the peculiar relationship that holds between the two probability concepts mentioned earlier. (2a) is a statement of degree of confirmation, hence a statement of probability$_1$. (2b) is a statement of the estimate of the relative frequency in the whole population, hence a statement of an estimate of probability$_2$. Therefore T says that probability$_1$ may be interpreted, at least in certain special cases, as an estimate of probability$_2$.)

Suppose that the observer has to make a practical decision, perhaps of an administrative or legislative nature, a decision depending upon his knowledge concerning the relative frequency of M in the population of Chicago. It is clear what he will do; he will act in certain respects

[8] For the present discussion it does not matter whether c in this case is equal to the relative frequency observed or only close to it (see *op. cit.*, p. 86). I have chosen here the slightly different value 0.73 in order to make it clear that the estimated value to be discussed in what follows is equal to the value of c (here 0.73) and not necessarily to the observed frequency (here ¾).

as though he knew that the relative frequency was 0.73. But it is perhaps not immediately clear what the theoretical basis for this action is,—in other words, which rational procedure would lead to this action. Should the first or the second of the two sentences be taken as a basis for the decision? The proponents of the frequency conception of probability will perhaps say, the first, because this is a statement about the relative frequency in the whole and hence a probability statement in their sense. However, this first sentence is not known to the observer as long as his knowledge is restricted to the evidence *e* concerning the eighty observed individuals. The first sentence is not even highly confirmed on the basis of the evidence *e*. It is rather the second statement that may serve as a basis for the decision. This statement is known to the observer because it is, in either of the two equivalent formulations (a) and (b), analytic; it follows from the presupposed definition of the degree of confirmation *c* and, for (b), the definition *D* of the best estimate of a function. The statement (2b) is quite analogous to the earlier statement concerning the best estimate of the length of a rod. Here again, the statement about the estimate can not be either confirmed or disconfirmed by any future observations. Even if a complete census of the population of Chicago showed that the actual relative frequency were quite different from 0.73, this would by no means refute the statement that the best estimate *with respect to the evidence e* is 0.73. Here, as in the earlier case, the decision can be based on the given observational evidence *e* and the analytic statement which gives the best estimate with respect to this evidence *e*. It is the value of this estimate or, in other words, the value of degree of confirmation that justifies the decision.

We obtain the same result if we consider the following situation. Suppose that the observer wants to make a bet on the prediction that an arbitrarily chosen individual has the property *M*. This prediction is the hypothesis *h*, to which the statement (2a) ascribes the degree of confirmation 0.73 with respect to the available evidence *e*. Thus on the basis of this statement the observer will decide to give odds of at most 73 to 27 (or approximately, 3 to 1) on the prediction *h*. (The same decision could also, of course, be based on the statement (2b) concerning the estimate of the relative frequency.)

Our discussions have shown that statements of probability in the logical sense, that is, degree of confirmation, may be used as a guide for practical decisions. To use them in this way does not imply any apriorism, because these purely logical probability statements are not meant to be used in isolation but rather in application to the concrete knowledge situation at the time of the decision. Every decision is based on expectations. To find a rational basis for decisions we must have a rational method for obtaining expectations, and, in particular, estimations. Methods of this kind are used in the customary procedures of inductive thinking, both in everyday life and in science. These customary procedures contain *implicitly* the concept of degree of confirmation. To make this concept and thereby the procedures based upon it *explicit* is the task of inductive logic. In thus helping to provide a clarified rational basis for decisions, inductive logic can serve as a tool not only for theoretical but also for practical purposes.

*GENERAL SEMANTICS IN READING INSTRUCTION**

FRANCIS P. CHISHOLM

I SUPPOSE THAT most schools now recognize that teaching students to read more closely and effectively is one of their primary duties. This duty, of course, has always been explicitly recognized by the elementary school. Teachers of the older students, however, have often built their practices on the assumption that 'learning to read' is something which their students did (or should have done) once and for all in their elementary school careers. Basic reading skill could be expected of high-school and college students, who then proceed to 'more difficult reading matter' and amass a 'larger vocabulary' to deal with 'more complex ideas.'

This point-of-view has now been rather thoroughly discredited in secondary education, where, at least in theory, teaching reading is the responsibility of every teacher in the school, and not the job of the English teacher alone. High-schools no longer assume that reading is something their student 'passed' sometime ago in another grade. Whether the high-schools are actually building flexible and powerful 'reading habits' in their students is perhaps in doubt, but their recognition of their responsibility is almost unanimous.

Colleges have been somewhat slower in accepting the same responsibility toward their students. Until recently, the universal English One was supposed to 'take care of' any reading 'deficiencies,' despite the fact few faculty-members, least of all the English teachers, were satisfied with the results. At the present time, many colleges are experimenting with new methods of dealing with the 'reading problem'; perhaps it is now the livest professional problem.

It is encouraging indeed to note this stir of professional interest, for it is a response to a social problem of the very first importance. A primitive tribe can take its language (and the attitudes enshrined in it) 'for granted' in its relatively stable environment; but a modern democracy, whose citizens must adjust to (and help direct) social change, demands a citizenry which can interpret alertly and maturely the language in which its discussions take place. We live in a symbol-saturated culture: our ways of using and reacting to symbols, our ways of describing things, our ways of understanding statements, etc. (in a word, our neuro-semantic reactions) enter into every life-situation. Our distinguishing human characteristic is that we are symbol-users: it is probably impossible to overestimate the importance of training a mature and scientific use of this basic human tool.

I suppose that everyone would agree that the training we ourselves have, and which we are giving to others, is not good enough. I do not think it necessary to feel that pessimism (about the future or about 'human nature') which to some

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people is a corollary: but we cannot help recognizing a kind of breakdown in our communicative machinery, whether we measure that by the growth of unbalanced and violent attitudes, by the apparent failure of many discussions to achieve agreement, or by some other measure of our own, such as the seemingly increasing proportion of obtuse readers among our students. We have made highly satisfactory progress toward universal literacy: but obviously literacy is not enough. Semantic maladjustment is, if anything, more common among the highly literate. Many contemporary events (the rise of demagogic dictators, the spectacular success of somewhat questionable advertising, etc.) suggest that perhaps literacy alone, without trained evaluation habits, may be a public danger.

II

Certainly any investigation of the reading skill of any sizeable group of college students or of adults is, at first glance, discouraging for people who have faith that social progress is guaranteed by formal education. For the tests reveal what every teacher dealing with the problem already knows: that there is a great gap between what the test passage 'says' and what the students read in it. In classes, students are always ready and eager to 'debate' and 'discuss' an author's opinions: but, when they are asked simply to state what (good or bad, correct or incorrect) it was the author *said*, as many as 70% of many classes will be unable to give even a fairly accurate account. Opinions will be 'read into' the passage. Then, the student reacts as if 'what he read' was equal to 'what the author says.'

Sometimes the reader will project his own opinions, and see them reflected in what he reads. He credits the author with saying what 'any intelligent man' (*i.e.*, the reader) 'must' say on that subject. Sometimes he will project into the passage what he feels the author 'must have meant' in view of what the reader knows about him. Suppose that a corporation executive should write an article advocating increased governmental supervision of industrial production. Many people, knowing that the author was a 'business man' and that 'business men' are 'against' government regulation, are quite capable of summing up this article as 'a defense of the free enterprise system against interference by the government.' No amount of merely textual commentary will teach students who read in this way to do any better. The teacher, by explaining the text of the essay, may straighten them out on this particular passage, but they will repeat the pattern of their errors the next time they read.

Note what people who misread this 'business man' are doing. They are assuming that the connotations which *they* have for a class-name ('business man') *necessarily* describe every individual to whom the name can be applied. To put it another way, the generalizations which they have made about a class of individuals (no matter how these definitions have been made) describe each individual in the class without the further necessity of observing those separate individuals at all. This is equivalent to reacting to the actual world *as if* it happened to be the world of stereotypes, political cartoons, etc. It is important to notice that the misreading has occurred, not through ignorance, but through a disordered semantic reaction; the error has occurred because the reader's attitude toward symbols is radically immature.

A careful observer will be able to add many examples to like behavior from discussions he has listened to. A very frequent pattern in discussion consists of

an answer by B, not to A's statement, but to what B feels that A 'must have meant.' To illustrate this pattern, I transcribe a conversation I had recently with a student:

> People with college educations (the student said) know more, and hence are better judges of people.
>
> But aren't you assuming (I asked) that a college education gives not only what we usually call 'knowledge,' but also what we usually call 'shrewdness' or 'wisdom'?
>
> Oh, you mean that there isn't any use in going to college!

This pattern, filled in by the context of the conversation, accounts for a very large number of misinterpretations, misquotations, misrepresentations, etc., from which each of us has suffered at some time or other. Its existence suggests that many verbal distortions, which we are accustomed to interpret angrily as being malignantly motivated, may occur because so many people have trained themselves in inadequate and disintegrated semantic reactions. This student's response to my remark depends upon a long previous training of the student, which has resulted in the habitual behavior of reacting to every situation as if that situation could have only two values. I 'must be' *either* praising *or* disparging 'college education': since my remark did not sound like praise, I therefore 'must think' that college is 'no good.'

It is easy enough in a classroom situation to treat examples of misreading as if the reactions involved were matters of words alone, and hence 'serious' only in so far as they prejudice the student's success in a course. But the issues involved are much wider. In such situations the student is reacting to something (a remark, a sentence) as if it were something else (what he 'thought' it was); furthermore, he is unaware that the latter is, or *can be,* something other than the former. Now this is serious, for this unawareness, this reacting to an inaccurate picture of the situation (a picture nevertheless 'thought to be' accurate) is characteristic of frustration-producing experiences.

These considerations suggest that the problem of 'teaching reading' will be solved reasonably well only with a much wider framework than that within which it has been traditionally approached. Within the school, reading is not a 'subject,' but rather a basic skill, prerequisite to full participation in school and community life. In a written passage, someone has made some statements to the reader about something. No doubt the primary responsibility for 'clarity of expression' lies with the writer; but nevertheless the writer's effort, like the speaker's, is eventually at the mercy of the *reader's* set of habitual reactions. Communication between individuals (essential to the co-operative solving of our largely symbolic *human* problems) can be as quickly abolished by unskillful *i.e.* (disordered) reading and listening as by confused writing and speaking.

Unfortunately, it has been traditional to try to solve the problem of teaching reading by beginning with the content of the language passages: *i.e.,* reading has been treated as primarily a process of apprehending the 'meaning of words.' Many teachers seem to think of reading as if it were a passive process, by which the 'meaning' of the passage is registered in the student if he 'knows' the words. But human beings are not cameras, nor are words the kind of stimuli which unequivocally carry their own 'meanings' with them. Whatever techniques we adopt must be based upon the scientific knowledge that the reading process is an

active organization by the reader, suggested to him by the sentences he reads, but formed into a 'meaningful' experience by the pattern of his *own* reactions.

Hence, if we find unsatisfactory reading, we must make our specific diagnosis in terms of the reader's trained reactions to symbol situations: we cannot solve it by analysis of language *alone*. The problem is in the reader, not in the content of the passage he is reading.

And, in the reader, what we must be concerned with is not what too many teachers worry about: 'lack of vocabulary,' ignorance of 'ideas,' etc. Ignorance and inexperience are relatively curable, given a workable method *in the student*. What the teacher of reading must be concerned with is the pattern of the student's reaction to symbol-situations, his attitude toward language, his *evaluating* of what he reads; in other words, the ordering of his neuro-semantic reactions. If a student is to learn to read well, to overcome primitive behavior in language-situations, he must be trained to react maturely; he must acquire habits of proper evaluation. For it is the pattern of his active, habitual experiences which organizes 'what the passage says' into what the passage 'means' to him.

If we are to learn to teach (and not merely advocate) 'intelligent reading,' we must, I am convinced, deal with students on this fundamental level. And doing this involves reexamining our assumptions about what we are doing, so that we can take advantage of the large quantity of new knowledge about the human use of symbols which has been discovered during the last generation. This knowledge is essentially knowledge of the mechanisms and processes involved in human reaction to (symbolically-organized) situations. Intelligent, mature, skillful reading involves some knowledge of the relations between symbols and what the symbols are symbols 'of,' of human methods of organizing (perceiving) and symbolizing situations, of the life-effects of semantic habits, of the mechanisms and processes which underlie behaving with symbols, etc.

This knowledge is the content of the science of general semantics, which supplies for the teacher of reading that 'wider basis' for a solution which we have just mentioned, and in addition suggests a large number of empirically tested and immediately useable devices.

III

The problem of general semantics is to make clear the processes by which human beings formulate situations in symbols and react to these linguistic formulations. In other words, it is the science of language-fact relationship and the processes underlying communication. But, as Alfred Korzybski has shown conclusively, the problem is much more than an abstract logical problem. As general semantics is formulated in his pioneer text and in the work of his collaborators, it deals also (and inescapably, since this is part of a single unified problem) with the life-implications of linguistic formulation.

All this, you may say, sounds rather complex and formidable; what does it have to do with the immediate classroom problem of teaching students to read at least a little better? Well, first of all, the greatest immediate obstacle in the way of any attempt to improve reading is the reader's unconsciousness of the mechanism and structure of his disordered semantic reactions. The assumptions which underlie his faulty reading are unconscious (and hence uncontrollable); he is unable to see how the 'meaning' he found in the passage, or his reaction to

it, can be faulty or inadequate.

Therefore, training in general semantics is a very powerful technique for improving 'reading habits' as well as other reactions to symbols. For general semantics provides techniques for making conscious (and therefore *controllable*) the unconscious assumptions which lead to improper evaluation. It has been shown empirically that understanding the nature of language-situations is itself a very powerful developer of more mature reaction-patterns, and hence of more adequate 'command of the language' and response to symbols. The probable explanation of this fact is that so large a proportion of inadequate language-reactions stem from a 'misunderstanding' of language-fact relationships. (I put the word in quotation marks to indicate that I do not necessarily mean a conscious misunderstanding. It is not a matter of holding a false theory, but rather of proceeding *on the basis* of a silent assumption about language which is not in accord with empirical fact.)

Every observer of language-behavior can call up examples of such 'misunderstandings' of language-fact relationships. One of those most commonly met in teaching reading is the 'one word—one meaning' fallacy. Suppose a class is directed to read an essay in which, among other things, the author states that he believes that college education should develop 'open and enquiring, *skeptical* habits of enquiry.' Many students in that class will read that the author advocates atheism, religious disbelief, etc. If some one objects that the interpretation doesn't seem to fit the context, these students will triumphantly announce: 'But that's what he says! That's what *skepticism* means!'

Such a pattern of reaction has been reenforced by many social factors (such as the still prevalent school-marmish worship of 'the dictionary'), but most of all by the silent assumption that words are more important than what words point to. It is easy enough to show students by examples, by exercises in paraphrase, that no word *ever* has the 'same meaning.' But even that does not break him of the unscientific (and dangerous) habit of feeling that the way to solve a problem is to arrive at an agreed definition of a *word*.

Yet, certainly, for adequate reading, the question for the student to consider is not *'the* meaning' of any word (skepticism, democracy, cat, dog, the Chrysler Building, etc.), but rather what the words *as the author uses them* are symbols of. This point is crucial, because it involves the relationship of symbols and events. Unless the reader understands it, he can only see in what he reads the reflection of his own 'meaning' for words. Furthermore, he will constantly be led astray in his reaction to what he reads. If the author uses a given word (skepticism) to indicate A (inquisitiveness) whereas I would have used it to indicate B (religious disbelief), I, as a reader, will only be thrown off from considering what he said (deep or shallow, good or bad) by study based on trying to find out what 'skepticism' 'really means.'

Empirical evidence shows that we can train more adequate habits in a reader if we give him a structural explanation of the language-fact relationships involved. One such structural fact about language, for example, which is basic to a scientific general semantics, is that there is no necessary connection between the 'things' of the world and the words we use to describe them. You don't eat the printed restaurant menu. Any linguistic formulation is only a kind of map of something which, whatever it is, is *not* the words used to describe it.

IV

The first immediate importance of general semantics in the teaching of reading is to furnish the student with some *structural* notions of the relations of language and 'facts.' If he is confusing definitions and events, formulations and realities, the explanation of his confusion helps him to overcome it. His infantile feeling (that certain words *have* to go with certain situations) becomes something he can deal with and change only after a structural explanation enables him to see what his present habits assume. For until it is made conscious, it is just part of the situation to him, something forming the situation of whose existence he is unaware.

Nobody 'really believes' that symbols dominate and control 'nature' (the assumption of primitive magic) or that some words equal reality (identification of formulation and thing formulated); but many people continue to *behave* in a manner which assumes these beliefs, without realizing that they are so behaving.

In general semantics, symbols are considered as being on different levels. Korzybski's basic teaching analogy is the comparison of a statement to a map, which may be 'good' or 'bad,' depending on how it reflects the structure of the territory. But, good or bad, the map is *not* the territory, nor does it tell *all* about the territory. Furthermore, we can have maps of maps (statements about statements) indefinitely.

My own experience has been that this explanation reduces considerably and immediately the amount of 'misreading' among college students. The various 'misreadings' which come from feeling that a word must always 'mean' the same tend to disappear when students begin to feel that statements are on different levels. Many of them begin to develop the ability to see 'through' the words to what the author is talking about.

It is, of course, on the interpretation of very highly abstract words (more accurately, high-order abstractions) that most students have difficulty in reading. Such words are often symbols for semantic disturbance, or attempts to create semantic disturbance: this fact has led some people to 'distrust' all high-order abstractions. In students we find, just as often as we find a belief in 'real meanings,' a feeling that no word on a higher level than 'dog' or 'cat' *can* be used 'meaningfully.'

Instruction in general semantics performs a very useful function for these readers. Very few of them have ever considered the difficulties involved in the symbolic formulation of situations; most of them in addition have been prevented from understanding language-fact relationships by their own unconscious assumptions about those relationships. My student, whom I mentioned earlier, who concluded that I 'must be' either 'praising' or 'blaming' college education, had this rigid reaction because of just such an assumption. Even a little discussion about non-identity, levels of statement, functions of language etc., makes the evaluations of many of them more flexible.

V

This last result brings us back to what I feel to be the prime importance of general semantics for the teaching of reading: that it keeps our consideration (and our students') riveted on the question of the structure of the reader's reaction. It cannot be repeated too often that misreading, being in the reader, cannot be cured in the text. I have found that it is helpful to teach some facts about the structure of human reactions to symbols

as well as those about language-fact relationships we have just discussed. It is necessary to repeat this, and to insist on it so strongly, because, in most of us who handle the reading problem professionally, the language-centered tradition of our training is so strong that it seems more 'natural' to approach the problem from the direction of language.

But in fact, in social action, in education, etc., what counts is not what the text 'means' in the abstract, what the author or speaker 'meant to say.' If I listen to a lecturer, what I go away quoting him as saying, what I actually 'heard' him say (even though it is far from what he 'meant') is what he has communicated to me.

Hence, unskilled listening, misunderstanding, etc., on my part prevents exact communication. It leads to radical misevaluation by me of the speaker and of the speaker's words; it leads me to action based upon a false formulation of the situation. The whole incident may be a trivial one, but in principle it is serious. (What difference would there have been in contemporary history had a large proportion of Germans reacted to Hitler's talk of the 'Greater German Reich' as if the symbol represented a semantic disturbance in Hitler rather than as if it represented a 'reality?') I have my 'meaning,' 'opinions,' my ways of reacting to symbols. But I may be completely ignorant of how I achieved these 'opinions,' and quite unconscious of the *structure* of my reactions to symbols presented to me. Unless these considerations are called to my attention, I will be simply unable to see how my reaction to the speaker, what I 'heard,' what I feel and do, *can* be 'wrong.' I 'heard what he said,' and 'any normal human being' would of course react just as I did.

What must the student know to transcend this communication-defeating attitude? General semantics (and the results of those who have taught it to students) suggests several techniques. The student must learn *not* to respond to symbols as if they were signals for immediate invariable total reactions; that is, he must transcend 'signal reactions' such as those displayed by Pavlov's animals or by choleric humans whose bloodpressure rises when the name of the opposition political party is mentioned. He must learn to check or delay his response until he relates the symbols to some real situation other than his own inner trained likes and dislikes.

To do this, he needs two different kinds of knowledge and training. First of all he needs to know something of the 'neuro-semantic' side of general semantics: he must see the difference between signal (automatic) and symbol reactions. Without structural explanation, advice to the student to delay his response to his reading, not to 'burst out with hasty opinions,' not to assume that his first reading is 'what it says,' etc., remains merely good advice: excellent, something to which he will 'agree,' but which he will have no technique at all for carrying out. As formulated in general semantics, attainment of mature symbol reactions is not an 'ideal' to be praised, but becomes a problem for the student to solve.

Second, the student needs to realize the indivisibility, the unitary 'body-mind' character of his reaction to symbols, which is often concealed from him by conventional instruction in language in the abstract. A little study shows how, in fact, we learn our language; how, with our vocabulary, we absorb attitudes and valuations suggested by the weightings ('emotional connotations') which the words have in the social groups we belong to. Such study brings home to the

student very rapidly the total-organic nature of language-reactions. It also has the effect of making him more sensitive to the shadings and weightings which the author put on the words. He can begin to look on what he reads as a map of *something* and judge it on that basis as good, bad, significant, misleading, deep, shallow, etc., rather than giving his immediate reaction to it on the basis of how closely it corresponds to the pattern of signal reactions which he happens to bring to it.

VI

In this brief treatment it is impossible to indicate more than a few of the general areas in which general semantics is useful for teacher and student of reading. Nor is it possible to give anything but a misleading account of general semantics itself. I am very conscious that a short article like this one does not help anyone at once to apply general semantics to reading instruction in the specific circumstances in which he works. I hope though that enough has been said to indicate that the *methodological* synthesis of knowledge (scientific, linguistic, epistemological, etc.) achieved in general semantics furnishes the basis for a broader and more adequate solution of the acute problem of teaching reading.

For all evidence points to the conclusion that, if we are to achieve what we hope for in reading instruction, we must include evaluation factors as well as training in word-recognition. The communication process involves both speakers and listeners, writers and readers, using a socially-constructed symbol-system, in whose structure 'reality' must be represented. This communication-process can never be even reasonably effective until the attitude of *both* parties toward their mutual language is reasonably mature; but the process can be destroyed more easily by listeners than by speakers. A wise man can learn from a fool, but a fool cannot learn from a wise man unless he ceases to be a fool.

We must guard against the notion that the problem of teaching reading in schools is confined to a number of verbally-awkward students, those who usually end up in 'remedial reading' clinics. Inadequate vocabulary, semi-literacy, a poor command of the technical terms of a field, etc., are not the only indications of a need for 'remedial instruction' in reading. Signal-reactions, inability to relate language to territory, and other neuro-semantic disorders are often combined with brilliant verbal facility. Some students do not so much read a passage as make it the stimulus for producing a verbal pattern touched off by their own personal reaction to the original *words*.

The final point which I want to make here in regard to general semantics in reading instruction is that general semantics brings scientific justification for a belief which English teachers have always held: the vital social and personal importance of language-instruction. (The corollary drawn by some English teachers, that the kind of instruction which most of us now give is adequate, does not however follow.) The pattern of an individual's neuro-semantic reactions underlies his personal adjustment and his social action: infantile reactions to symbols (including inadequate reading) are symptoms of a wider immaturity of personality. Hence language-instruction should always be undertaken in the wider context of the total reaction of the *student*, which is exactly what many great English teachers have long advocated. General semantics gives us the validated techniques for tackling our job on this fundamental basis.

MYTHS BY DUNHAM

MEL R. SABRE

In any case, the facts corroborate empirically what we have decided by theoretical analysis—that there is decided kinship between the semantic philosophy and the whole world of fascist and reactionary ideas.

BARROWS DUNHAM,
Man Against Myth, p. 266

THE FOREGOING is the main thesis of Professor Dunham's essay on general semantics, included in a book published two years ago as 'a guidebook to good sense and logic.' Dunham is dead sure of his good sense and logic, and perhaps by virtue of his swaggering certainty, or because of a dust jacket sporting the unreserved commendations of Albert Einstein and John Dewey, the book has enjoyed both a numerous public and a curious sort of immunity to criticism.

It would seem though, that a logic that can identify semanticists with Nazis by showing that both quoted Spengler, or reduce the tenets of the general semantics system to the absurd formula that 'All Problems Are Merely Verbal' should be subject to some sort of critical examination. And when the logician is so determined to demolish a system that he will call in the full battery of questionable rhetorical devices—from ordinary name-calling to the technique of contamination by association—then his motives must be equally suspect.

Dunham begins by erecting a shabby little straw man, labelled alternately as Logical Positivist, Operationalist, Semanticist. This poor lopsided figure is made to hold all manner of incongruous opinions, none of them very sensible to begin with, and as fast as he introduces them, Dunham sets about flailing them into his private inferno. The attitudes he examines are made so monstrous and so farfetched that it is hard to believe that Dunham is unaware of how little resemblance they bear to the systems being attacked.

Because of the semanticists' unwillingness to make moral judgments based on absolute polarities, Dunham charges them with reluctance to take any sort of social action. Their concern with making the structure of language correspond more closely to the structure of things, he describes as an addiction to verbalism that escapes reality in favor of 'trips to the library in search of the larger dictionaries.' Truant wisps of straw are gathered from statements so torn from context that they may be construed as Dunham wills. Semanticists are charged with a 'racist' bias through Ogden and Richards' mention of a 'darky anecdote'—although the book was written in England, where the absence of a particular social situation renders the anecdote innocent; in 1923, before Hitler's theorists made us doubly chary of such references. Chase, in 1937, had accepted the general temper of contemporary thought and misevaluated the implications of the war then being fought in Spain. He is also found to have quoted Dr. Alexis Carrel, while Korzybski himself acknowledges Spengler's work. On such evidence Dunham purports to have 'proved' fascist tendencies in the system.

The attack is vengeful, so grimly pointed at discrediting the system by thorough distortion of its principles, that Dunham's performance can hardly be explained as sloppy scholarship alone. Not when he so carefully *reverses* the general semantics formulations so that they seem to support

behavior the semanticists most oppose.

'All Problems Are Merely Verbal' says Dunham, and this he offers as the essential thesis of all semanticists:

> We are unhappy: perhaps if we knew how the word unhappiness is to be defined, we should discover that we are happy after all. There is no money in our bank account: perhaps if we really understand the syntax of 'there is' and the negativity of 'no' we should find ourselves rich. All perplexity is frustrated speech. All problems are merely verbal.[1]

Surely, if there is one single point that all semanticists have sweated to drive into the minds of men, it is simply this: words are not things . . . by playing with our symbols we do not change the physical state of things. A plea for sanity has risen from every source dedicated to the application of scientific empiricism to human thought processes. It has emerged most strongly in the writers Dunham pretends to interpret. From Korzybski, from Ogden and Richards, from Hayakawa, from Hugh R. Walpole: *Do not confuse the label with the object! Do not confuse the symbol with the referent! Do not confuse the map with the territory! Do not confuse the word with the thing!*

One cannot read the publications of any of the general semantics groups and remain unaware of this position on the relation of words to things. All possible emphasis has been placed on the restructuring of language patterns so that extensional (*i.e.*, real, phenomenological) data might be more accurately evaluated and acted upon. Yet our logician professes to find that semanticists are concerned *only* with labels, *never* with reality. They will permit 'the fascist remnants throughout the world . . . to multiply again, on the excuse that there are no persons corresponding to the term.'[2] When men are planning action against a threatening event, 'some semanticist is sure to arise and pronounce the label meaningless.'[3]

[1] Dunham, *Man Against Myth*, p. 236.

II

After learning that semanticists are verbalists, we find suddenly that they are guilty of an atomistic view of the world. Readers of Korzybski will have to look twice at Dunham's blithe pronouncement. The Korzybskian rejection of aristotelian evaluations was necessitated largely by the rejection of atomism—of static, absolute divisions in the extensional world. The system depends on constant awareness of integrative relationships, so intrinsic to the nature of things that phenomena can be evaluated accurately only in structural context. How, then, can Dunham declare that 'it is nevertheless quite plain that Korzybski ignores the fact of things interacting with one another,'[4] or accuse his students of 'atomizing the universe?'

One of Korzybski's root fomulations is that while the world on the lowest, nonverbal level, is composed of individual objects (individual or absolute only in the sense that they are not identical), the world to which humans react is one dependent on the interaction of objects and events. This is the principle of structure to which semanticists constantly return. Efficacious behavior then, comes from the accurate recognition of systems — of things acting dynamically upon one another.

As the only possible content of

[2] *Ibid.*, p. 239.
[3] *Ibid.*, p. 240.
[4] *Ibid.*, p. 258.

knowledge is structural, as given in terms of relations and multi-ordinal and multi-dimensional order; numbers, which establish an endless array of exact, specific, and, in each case, unique, relations, are obviously the most important tools for exploring the *structure* of the world, since structure can always be analysed in terms of *relations*.[5]

In this vocabulary, 'structure' is the highest abstraction, as it involves a whole, taken as-a-whole, made up of *interrelated parts*, the relations of which can be defined in still simpler terms of order. 'Knowing,' in its broadest as well as its narrow human sense, is conditioned by structure, and so consists of *structural* knowings. All empirical structure involves relations, and the last depend on multi-dimensional order. A language of order, therefore, is the simplest form of language, yet in structure it is similar to the structure of the world and ourselves. Such a language is bound to be useful for adaptation, and therefore, sanity; it results in the understanding of the structural, relational, multi-dimensional order in the environment on all levels.[6]

This principle is repeated in varied forms throughout *Science and Sanity*. Dunham, bent on demolition, pounces noisily on a single sentence in which the first premise is made: that each object exists as a 'rare and complex' individual event. And then, ignoring the all-important consideration of events in interaction, he proceeds to cry 'atomism'!

Now, if the man had merely misconstrued the point through failure to read sufficient of the text he criticizes, his attitude might be corrected by sending him a copy of the neglected paragraphs. But the point is important, not only in demonstrating Dunham's fixed intention to deride the system however flagrantly the facts are suppressed, but also in indicating a source of some confusion to more honest scholars.

Stuart Chase, whom Dunham finds a comparatively easy target, seems unintentionally to have teased on the attack. Chase is an enthusiastic student of Korzybski, but possibly in the interest of a lively literary style, has been far less careful over the wording of his ideas. He followed *Science and Sanity* in recognizing that not 'dogs' as a class, but dog_1, dog_2, dog_3, etc. exist in the extensional world—and that each of these is an abstraction from events on still lower levels. He fell by the wayside, however, when Korzybski pointed out that while the class of 'dogs' does not exist in the same sense that Lassie exists, it is still important to us as one of the workable abstractions upon which our knowledge is dependent. Through overstatement as much as misunderstanding, Chase has created for his readers a private wilderness in which trees, mankind, the profit system, political parties, and fascism, since they are not individual events but abstractions from specific events, seem to have no place in our reckoning.

The resultant inferences can be pretty dangerous. Though Chase is far too sensible to have intended it, many of his readers must have found themselves reaching an awkward conclusion: abstractions don't exist, so let's not confuse ourselves by dealing with any ideas that have no tangible referents. Dunham shows a rather wonderful agility in catching such loose ends unravelled from a systematic pattern and tangling them hopelessly to further his argument. Says he, of *all* semanticists:

[5] Alfred Korzybski, *Science and Sanity*, 2nd edition, p. 260.
[6] *Ibid.*, p. 161.

So now we see it all; there are no dogs-in-general, no mankind, no profit system, no parties, no fascism, no underfed people, no inadequate housing, no shoddy clothes, no truth, and no social justice. Such being the case, there can be no economic problem, no political problem, and no social problem. By the simple exhalation of breath, Messrs. Chase and DeVoto have conjured out of existence every major problem which has vexed mankind throughout the entire history of the human race.[7]

Fortunately, it is not difficult to end the confusion, and had Dunham cared to do so, he might have found the point carefully resolved in the source work he is supposed to have read. The clue is in the single word 'abstraction,' for which Korzybski had a precise, operational referent. With great contempt, Dunham tells us of the semanticists, 'their view is that individuals are real but classes and systems are abstractions.' Except for a qualification concerning the realness of individuals, Korzybski would have little quarrel with the statement. For him, to abstract is to extract certain shared properties from a number of individual cases —while recognizing the differences excluded through convenience. We must abstract in this way if we would have any knowledge of external structure.

Dunham however, chooses to interpret the process somewhat differently. Wherever he encounters the word 'abstraction,' he pretends to find Korzybski denying, for all practical purposes, the existence of any class or systems. If systems are abstractions in this sense, and fascism is a system, then semanticists have, ostrich-like, banished fascism from their world. Yet under Korzybski's terms, fascism is an abstraction of many properties from the theories and behavior of many people; as a system it is both real and dangerous, as a system it may be opposed and destroyed.

It does not need much emphasis to see that higher abstractions are extremly *expedient* devices. There is an enormous economy which facilitates mutual understanding in being able to be brief in a statement and yet cover wider subjects. Let us consider a primitive statement 'I have seen $tree_1$,' followed by a description of the individual characteristics; 'I have seen $tree_2$,' with minute individual description, where $tree_1$, $tree_2$, stand for names of the individual trees. If an event of interest happened in a place where there were a hundred trees, it would take a long while to observe fairly well the individual trees and still longer to give an approximate description of them. Such a method is non-expedient, *fundamentally endless;* the mechanism is cumbersome, involves many irrelevant characteristics; and it is impossible to express in a few words much that might be *important*. Progress must be slow; the general level of development of a given race or individual must be low. It should be noticed that the problem of evaluation enters, at once implying many most important psychological and semantic processes. Similar remarks apply to the abstracting of infants, 'mentally' deficient grown-ups, and some 'mentally' ill.

Indeed, as the readers of my *Manhood of Humanity* already know, the 'human class of life' is chiefly differentiated from animals by its rapid rate of progress through the rapid rate of accumulation of past experiences. That is possible only when expedient means

[7] Dunham, *op. cit.*, p. 260.

> of communication are established; that is, when higher and higher orders of abstraction are worked out. All scientific 'laws' and other generalizations of high order (even single words), are precisely such methods of expediency, and represent abstractions of very high order. They are uniquely important because they accelerate progress and help the further summarizing and abstracting of results achieved by others.[8]

Dunham is fond of deriding what he calls the 'besottedness' of Korzybski's prose. Whatever stylistic shortcomings he deplores, there seems little enough obscurity in the above. It is, at least, straightforward enough to preclude any such interpretation as he puts on the system. When he taxes general semantics with ignoring the reality of abstractions or dodging the issues of our times by writing them off as 'mere abstractions'—then the besottedness seems to lie less in the prose than in the interpretation.

III

This exercise in distortion is more than equalled by Dunham's attempts to discover racism in the semanticists. It is almost as though he had set himself a series of quixotic challenges: 'Here is a system which emphasizes integrative structure, extensional rather than verbal orientations, and a view of man as environmentally conditioned by his own symbolic devices. How then can I prove its perspectives to be atomistic, verbalistic, and of a racist bias?' The last feat turns out to need the wildest fact-faking of all.

He carefully ignores mentioning all that semanticists have written to free society from race fetishism. Can any man study the system and remain unaware of the work that semanticists have done, not only in the easy business of pointing out the perils of racism, but in seeking out the systematized thought patterns that are its cause? It hardly seems possible, when the most basic principles of general semantics make racism inadmissible.

Against all this, Dunham places his discovery of the Ogden-Richards anecdote and a suspicious sentence in *Science and Sanity:*

> The aristotelian system was the result of the semantic reactions of the white race of more than two thousand years ago; it built up the doctrines, institutions, appropriate to this system.

In context the sentence is innocuous enough—though Korzybski would probably today reject the term 'race' as too affective after its use by the Nazis. Nonetheless, the aristotelian system comprises the logical syntax of all the languages of western culture, spoken by that group of people arbitrarily classified as the 'white race.' There has been sufficient investigation of the non-Indo-European languages spoken by non-Caucasian peoples to determine that these differ in structure so that the aristotelian principles do not apply. Nowhere does Korzybski suggest that 'race' in any way decides the nature of thought, but conversely, he regularly stresses the all-important thesis that systems of thought are determined by the structure of man's habitual language. Yet from this same sentence, Dunham makes the preposterous conclusion that according to Korzybski 'systems of thought are determined by the racial origins of thinkers.' One can only whistle with awe. With what arguments could Dunham be answered?

When a man is dreadfully, unqualifiedly convinced of the rightness of his

[8] Korzybski, *op. cit.*, pp. 377-8.

ends, it is hard to impose on his methods any but his own criteria of acceptability. It is evident that Dunham has studied the men whose statements he distorts—he cannot conceivably be unacquainted with the facts. There is something quite familiar in the coolness with which he ignores them in favor of carrying forward his argument.

As a professional philosopher he knows full well the attitude of the logical positivists on value judgments. If a descriptive term is not measurable by any quantitative operation, the term 'meaningless' is applied . . . meaningless in a very special, very useful sense. But because the terms 'good' and 'evil' add nothing to our knowledge, as positivists define knowledge, no positivist pretends that we are prevented from choosing between alternatives or from taking sides on any of the issues that threaten our own or humanity's welfare. Because moral affirmations are not measurable, it does not mean that human suffering is condoned. It does not mean, as Dunham insists that the positivists, and by implication the semanticists, give cynical acceptance to brutality in the world. Nevertheless, all his name-calling, his suppression of facts, his tricks with mirror logic seem almost defensible when compared with Dunham's final resort to the baldest of emotional devices.

With grim intensity he pictures for his readers, the tortures the Nazis inflicted on their victims. 'I will pass over,' he says, 'what the Nazis did to other children, whose tongues they cut out, whose ears they cut off, whose bodies they used for target practise. I will even pass over that horrible pile of infants' shoes at the Maidanek death camp.'[9] And then suddenly we find that all who accept the philosophic methods of empiricism are somehow identified with the Nazi brutalities . . . 'the sort of happening which verbalists have done so little to prevent.'

The transition is effected so rapidly that it stuns. By disallowing the operational value of moral judgments, one is supposed to exculpate or even become party to the most depraved of cruelties. The qualifications put on the term 'meaningless' are all suppressed. So too, are the allowances made for action—the *insistence* on action against socially injurious agencies.

When all such devices are admissible, then words spin thinly through the air, free from reality, weaving their maleficent spells. Anything can be claimed, anything can be demonstrated. It would be pointless to suggest to Dunham what every responsible scholar knows—that any man's doctrines may contribute theories to conflicting systems. If Korzybski and Hitler have both drawn from Spengler, Stalinists and Trotskyites stand firmly with Marx. Father Coughlin finds justification for anti-Semitism in the teachings of Christ. Both J. Parnell Thomas and the liberals who suffer his crusade are professedly engaged in defending the Constitution.

Spengler himself has been variously interpreted by Haushofer and the very Christian Professor Toynbee. It would do little good similarly, to suggest that the essential fascism of Spengler seems quite unreal when one reads his attack on that system in *The Hour of Decision,* or to mention the ideological use to which Hitler's thinkers put the Hegelian system which supplies the logic for Dunham's own arguments. The twisting of truth, the logical sins he commits are of no interest to Dunham; his sole justification lies in the ends he seeks—the thorough blackening of those philosophies which seem to threaten his own position.

[9] Dunham, *op. cit.,* p. 253.

Throughout his book, we find Dunham flinging the dark blanket of 'fascism' over all ideas he wishes to blot from consideration. The process is wholly commensurate with his basic philosophic orientation—the closed system of Hegelian-Marxist dialectics. It is a system dependent on the sanctity of the aristotelian copula: things *are* or *are not* directed towards single ends; unallied phenomena are antithetical; what is not white is black; what does not further each detail of the social program of Marx and the angels must belong to the opposition and be labelled 'fascist.'

It is hardly difficult then, to see the source of Dunham's hostility to the operationalists, the positivists, the semanticists—to any school which formulates its precepts in accordance with a world stripped of static absolutes, viewed as a flexible structure. The sharp dichotomies between social forces, the notion of evil massed against good, the very faith in one's own unassailable righteousness that characterize Dunham's viewpoint, are dependent on his orientation to another sort of world. The categorical, two-valued logic of the Hegelians has been codified; realities, sensorily perceived or logically deduced, have been neatly pigeonholed for all time. It cannot survive the introduction by modern science of a new vision of the world. When the fundamental entities become only events; when processes can no longer be split into tidy elements; when space becomes a network of intervals, inseparable from time; when all distinctions must be graded quantitatively on a many-valued scale; when the principle of uncertainty is implicit in every statement—then the system of the Marxist collapses, finding no corresponding structure in the world of things, and all his complicated dogma becomes untenable.

It is not at all surprising therefore, to see Dunham striking out against the scientific systems that would dissolve all justification for his faith. Nor should it be surprising to see the irrational savagery of the attack, for his ideology weighs its methods by the single, pragmatic standard of efficacy and has no petty distaste for twisted logic or the suppression of truths. It is always startling however, to learn each time anew, how easily we all are taken in by the smooth arrangement of such arguments. How much longer we will continue to find good sense and logic in the formulations of the Dunhams is a neat problem for semanticists, and at this point in history, for all the world.

Things that now seem as simple as common sense . . . cost incredible labor to invent. . . . For example, as Bertrand Russell observed, 'It must have taken many ages to discover that a brace of pheasants and a couple of days were both instances of the number two.'

E. T. BELL, *Men of Mathematics*

☆ BOOK REVIEWS ☆

Sciencefiction, 1948

THE WORLD OF Ā, by A. E. van Vogt. New York: Simon and Schuster, 1948. 246 pp. $2.50.

This is an expanded version of the serial by van Vogt published in *Astounding Science Fiction* for 1945. So far as I know, that serial was the first appearance of non-aristotelianism in a work of fiction, specifically Sciencefiction—SF. May it not be the last. As it was the first, it should be of interest to readers of *ETC.* to see in some detail what impression Ā has made on a master of the story-teller's craft.

With his customary skill, familiar to all SF fans, van Vogt tells a most unusual story of the year 2560 A.D. Not everything in that ingenious age is markedly different from its homologue in the humdrum present. Villains still tote the rods one might have hoped will survive in the post-atomic age only in nurseries. But they also wield 'blasters,' which is all to the good, and interplanetary travel is a commonplace. The last, of course, is plainly in the cards. Although millions now living will not, as Pastor Russell used to yawp, witness the Second Coming of Christ, they almost certainly will see the first landing of men on the Moon, and possibly also on Venus. That is, unless our aspiring race somewhere in the next half-centruy suffers an atomic apotheosis in its holy crusades to stop some ism or other. As for Venus, it will be exciting for our successors, if any, to check up on van Vogt's amazing Venusian trees. Those enormous growths are a touch of SF genius, and apparently quite possible if atmospheric conditions on our sister planet are as imagined.

But we must proceed to the semantic implications of the story. Unless I have totally missed a main drift in the narrative, the hero's quest is himself or, as the novel plot develops, one of his actual or potential cortical selves. It is as if Galahad were his own Holy Grail—if you get what I mean. I'm not sure that I do myself; but putting it that way induces a pleasant Ā glow.

I have to confess to a certain delicacy from here on in presuming to discuss the world of Ā, as I still backslide occasionally and thoroughly enjoy wallowing in the troughs of aristotelianism. To provide the proper antidote for what is to follow, I may refer the reader to Korzybski's *Science and Sanity,* Part IV, where the semantic mischief of the cortex-thalamus setup is analyzed. Indeed, unless the reader of van Vogt's story has at least skimmed *S. & S.* he may miss some of the subtler shades of iniquity, and find himself not obscening thalamically, as I did, on first meeting the heroine.

When that precipitant young woman bumped chest-first into the hero, I felt, 'Here we go again.' And when the curiously assorted couple prepared to shake down for the night in a deserted weed patch, I sensed, 'Now we really are on our well-rutted way.' My lickerish thalamus was not wholly to blame; I had just finished reading *Raintree County.* But we were not on our way. That heroine, I fear, will be quite a disappointment to unreconstructed aristotelians. She seems to have about as much carnality as a dead

shad. What happens in the weed patch, and elsewhere when she is around, is strictly Ā. That also is all to the good. It may be a symptom that the literary permutations and fornications of boy meets bitches are about to peter out. So much for the thalamic aspects of the story.

The more cortical readers of *ETC.* will want to know how Ā is woven into the plot and integrated with the fast-stepping action. It is not easy to say. However, the following excerpt may give a sufficient hint.

> Behind that conscious integration [of 'the event that was himself, as he was, his body and mind as a whole, amnesia and all, as of this moment on this day and in this city'] were thousands of hours of personal training. Behind the training was the non-aristotelian technique of automatic extensional thinking, the unique development of the twentieth centry which, after four hundred years, had become the dynamic philosophy of the human race.

The city is dominated by the colossal Games Machine, a superhuman complexity of electronic nerves and nuclear (?) memories from which (or whom?), as from the all-seeing Yaweh of old, no secrets are hid. The Machine's knowledge makes the omniscience of all gods up to 2560 A.D. look like the stultified ignorance of a Mongolian imbecile. Its designer (s?) was (were?) non-aristotelian, and the last (or first?) brooded over the 'Research Department, the Semantic Institute, Korzybski Square, City.'

That auspicious name, the hasty Ā-semanticist might surmise, would preserve the Machine in perpetuity. But no: sloganized stupidity from Earth to Venus, and galactically beyond both, is as potent in its own vast realm of 2560 as were its piddling terrestrial precursors of 1940-1947 in the resounding incantations of such global peanut magic as 'The Four Freedoms,' 'The Eight Burps,' 'The Truman Doctrine,' 'Stop Vegetarianism,' and 'The Marshall Plan.' I begin to have an uneasy suspicion that somebody's leg is being pulled in all this. The political thalamus of 2560 is still, as in the 1900's, mightier than its accompanying cortex. But let the author report:

> Through the empty frames [the hero] stared out toward where the Games Machine had once towered like a jewel crowning the green Earth. Where it had been, thousands and thousands of truckloads of soil had been dumped, perhaps with the intention of leveling all traces of the symbol of a World's struggle for sanity.

Four hundred years of 'the dynamic philosophy of the human race' had triumphed in the transmutation of Asses into Āsses. *Sic semper sanitas.* The accent in aspiration, as of 2560, is still on the first syllable. It all sounds like a satirical forecast of what is about to happen to the United Nations' aborted monstrosity.

Whether or not the author intended to give the evangelical optimism of some of our more eminent Ā-semanticists a mild ribbing, he has done a streamlined job of just that thing, and therein (to me) lies the principal charm of his story. Of course I may be miles off the beam in all this, and in dire need of a semantic purge. But it does seem to me that the author must have started out with a sincere belief that Ā might debestialize one ten-thousandth of one per cent of our aspiring race in, say, five hundred years. Then, as his story began developing according to its own infernal consistency, he had to let go of its tail. It thereupon dived to the bottom of perdition on its

own Ā course, and delighted at least one of its readers, if not its author, by fetching up such a coruscating gem of sardonic irony as that on page 237. That says it all. The gospel of Ā, as of 2560, is tripe.

But this is a story, and only lowgrade A-morons are everlastingly on the lookout for moral or other seductions to self-improvement in everything they read. A bang-up SF adventure story, such as this is, is amoral. Old grandpa Longfellow notwithstanding, life is not always real, nor is it always earnest, and almost anyone but a theologian or a congenital idiot knows perfectly well that its goal is the grave. So why not relax occasionally with an amusing book? The story is the thing; and, if I may be permitted to say so without disrespect to either *ETC.* or 'The Semantic Institute,' to hell with the semantics.

By the way, now that I think of it, whatever became of the heroine? You won't find out by looking at the last page. And if you cheat by looking at that page (it will surprise you) before reading the rest of the story, you deserve to find the heroine in your own bed.

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Recently J. B. S. Haldane and also Dobzhansky and Ashley-Montagu have stated that the most important fact about heredity in human affairs is that we inherit the capacity to change. They point out that it is the adaptive plasticity rather than the fixity of our inherited patterns which is our greatest heritage. Biologically this is undoubtedly true: but it would be fallacious to deduce from this biologic plasticity that we are equally free and plastic psychologically. Unfortunately these same human beings who have inherited this adaptive plasticity also limit their own freedom through certain rigid psychologic mechanisms which confine closely their instinctual patterns. In their more symbolic forms these rigid mechanisms produce the phobias and compulsions with which we are familiar in psychopathology. Identical although subtler phobic-compulsive forces distort and restrict and guide every instinctual process in human life. This limits our freedom and plasticity almost as effectively as if we inherited unalterable patterns. In fact it is this compulsive rigidity in human nature which has led so many psychologists to take it for granted that we inherit many fixed patterns. The difference remains important, however, since it is reasonable to expect that in the course of time it will be within our power to alter and modify our limiting compulsions and phobias by processes of emotional education; whereas the rigidity of inherited patterns could be altered only by the infinitely slower processes of evolution.

LAWRENCE S. KUBIE: Instincts and homœostasis. *Psychosomatic Med.* 10:15, 1948.

☆ CORRESPONDENCE ☆

Hayakawa Censured Again

SIRS: In the paper 'The Revision of Vision,' by S. I. Hayakawa (*ETC.*, IV, 258-267, Summer 1947), the author, referring to the word 'semantics' states that: 'the word is, although getting increasingly familiar, only vaguely understood except by people who have gone out of their way to acquaint themselves with semantic literature.' Although I have some 'acquaintance with semantic literature,' Dr. Hayakawa's use of the term confuses me.

He describes 'two kinds of semantics' as follows: 'The first I shall call, using Korzybski's term, the semantics of identification, using the word identification in the special sense of identifying the symbol for a thing for the thing itself.' And this he contrasts with 'the semantics of non-identification which would mean simply NOT reacting to words as things.'

To me, it is not clear whether Dr. Hayakawa wishes to imply that Korzybski's work represents a 'semantics of identification' or a 'semantics of non-identification' or just what connection he intends the reader to make between his use of the term 'semantics' and that portion of Korzybski's work referred to in footnotes 1 through 4. The phrase 'semantics of identification' does not appear in any of Korzybski's published work and I am certain he did not coin it as is implied in Dr. Hayakawa's statement.

I am in complete agreement with Dr. Hayakawa's statement that the term 'semantics' though getting increasingly familiar is only vaguely understood, *and for that reason* I believe the readers of *ETC.* should be given a more exact explanation of this term than is to be found in Dr. Hayakawa's paper.

I would like to call attention to the original reference work in *general* semantics: Korzybski's book, *Science and Sanity: An Introduction to non-Aristotelian Systems and General Semantics,* Lancaster, Pa.: Science Press, 1933, second edition, 1941. Before this work was produced, the term 'semantics' was relatively unknown because it was used to name a branch of Philology, in which only a few people were interested. Semasiology, semiotic, etc., are titles similarly used to refer to branches of linguistic study, but *general* semantics is of the title chosen by Korzybski to refer to *his* work, which is psycho-biological in orientation; concerned with neuro-linguistic and neuro-semantic environments as produced by, and as, in turn, affecting, human nervous systems. In his work, Korzybski uses the word 'semantics' in the sense of 'evaluational' usually as an adjective as: 'neuro-semantic factors' or 'semantic-reaction.'

When *'ETC.: A Review* of GENERAL *Semantics'* publishes papers in which the term 'semantics' is NOT used as Korzybski and his students use it, I would suggest that the editors make this clear to readers, so that old or new students of general semantics or casual readers with little acquaintance with 'semantic literature' will not be confused. On this point, the confusion has not been clarified in other papers published by *ETC.* which might

even be more generally regarded by students as authoritative references. For example; it seems curious to me that the term 'general semantics' is omitted in the glossary of general semantics by S. I. Hayakawa and Anatol Rapoport published in *ETC.*, III, 279-283, Summer 1946. Instead, under the term 'semantics' it is stated, 'in general semantics, the word is ordinarily used in the latter sense (semiotic).' Yet from careful study of Korzybski's work it becomes obvious that 'semantics' can refer to no more useful a science than could be developed by trying to build up a 'zoology out of unicorns'! It seems to me that this is a *most serious* omission, since if the term *'general* semantics' were included, it would then be necessary to explain that it has *nothing* to do with 'semantics.'

Under 'extensional devices' in the same paper, the authors give 'hyphens, quotation marks, indexes, dates, etc.' implying that it is only a linguistic, perhaps even grammatical issue, and avoid emphasizing the fact that *general* semantics is an empirical, natural science. The *etc.* as printed does not appear as a device when it is really one of the most important *working* devices.

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In a sense Columbus was not unique, but it was unique that he changed his frame of reference.

TRIGANT BURROW, *The Biology of Human Conflict*

NEWS NOTE

The following were elected officers of the International Society for General Semantics in the mail elections held in May and June: *President:* FRANCIS P. CHISHOLM, Ph.D., Chairman of the Department of English, State Teachers College, River Falls, Wisconsin; *Vice-President:* ELWOOD MURRAY, Director of the School of Speech, University of Denver; *Secretary-Treasurer:* KARL G. HAUCH, Investment Department, Mason, Moran and Company, Chicago.

☆ EDITORIAL ☆

Semantics, General Semantics Again

THERE HAS BEEN considerable criticism on the part of a few readers of *ETC.* concerning the use of the term 'semantics' and 'general semantics' in these pages. It is charged that often the two terms are indiscriminately interchanged and that the failure to make a sharp distinction adds to confusion about both semantics and general semantics.

The fact of the matter is that contributors to *ETC.* quite frequently fail to make the distinction between 'semantics' (a kind of blanket term referring to many kinds of logical, philological, anthropological, psychological, and other inquiries into language and symbols) and 'general semantics' (the system originated by Alfred Korzybski and presented in *Science and Sanity).* Ever since *ETC.* began publication, the Editors have been on guard against this confusion, and have inserted the word 'general' before 'semantics' whenever the context revealed that it was Korzybski's system that was being referred to.

No doubt some instances of this confusion escaped the vigilance of the Editors. Granting that this and other confusions result from our terminology, is there a remedy? 'Defining one's terms,' as every student of general semantics knows, can help, but it is not the magic road to understanding that those with aristotelian habits of mind believe it to be. Indeed, the general semanticist more than any one realizes that 'defining terms' is at best a verbalization of the abstracting processes that go on inside the definer. Only if a cooperative communicative process already exists between the individuals involved will definitions be of further value in maintaining that communicative process. If no such process exists, both parties to a dispute can keep on 'defining terms' endlessly, getting very angry doing so, with no discernible progress in establishing communication.

But since, among students of general semantics, an environment exists in which 'defining terms' can further the communicative process, what shall be the basis for the most fruitful definitions? There are no 'inherently' *correct* meanings in the terms themselves. In fact, one of the most important achievements of semantics (the old linguistic kind) *and* of general semantics is the demonstration of the nonreality of 'inherent meanings' and the resulting blanket dismissal as meaningless of all questions in the form, 'What is so-and-so *really?*' People who approach the problem in this way (What is semantics *really?* What is general semantics *really?*) can never get satisfactory answers to these questions, because the only people who could conceivably give authorized answers (semanticists and general semanticists) will undoubtedly dismiss these questions as meaningless.

The need for definition has arisen, it appears to us, from the fact that Korzybski's general semantics has been so influential as to affect those areas of study formerly subsumed under such names as

'significs,' 'psychology of language,' 'biolinguistics,' 'semantics,' 'semiotic,' 'logical analysis,' etc., and to unite them, both in scholarly and popular apprehension, as related fields, which, at the next higher level of abstraction, may be regarded as one field, namely, 'semantics.'

The fact that 'semantics' was formerly used in a special philological sense does not deprive present workers in the field of the right to use the word in an extended sense to apply to orientations, methods of evaluation, etc. We offer, as is customary in scientific lexicography in discussions of this kind, the following illustrative quotations:

> Identification may be considered as the remains of pre-human, or primitive, or infantile, one-valued *semantics,* which establishes, or results from, *semantic* states, by which the essentially infinite-valued facts of experience are not differentiated or evaluated properly, and so the many values of these facts are identified into a single value.[1]

> But among humans we cannot avoid training, through the mechanism of language and its structure, in some, most often unconscious, *general semantics,* and so a great deal depends on what kind of *semantics or methods of evaluation* we impose on our children.[2]

> A language of 'true' and 'false' involves *two-valued semantics;* the introduction of adverbs or their equivalents introduces modality and so *three-valued semantics.* The introduction of indefinitely many degrees between the 'true' and 'false' leads finally to *infinite-valued semantics.*[3]

[1] A. Korzybski, *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics* (2nd edition), p. 462.

[2] *Ibid.,* p. 462-3.

It is in the sense illustrated in the above quotations that Hayakawa used the terms 'semantics of identification' and 'semantics of non-identification,' with which Dr. Guila F. Beattie takes issue in her letter to the editors, printed in this issue of *ETC.,* (p. 286). It is to be remarked that in the second of the above quotations, Korzybski uses the expression 'general semantics' to refer to over-all patterns of evaluation and/or orientation derived from *any* kind of education. In order to avoid confusion, it has been a rule in the editorial offices of *ETC.* not to use this expression in this broader sense, restricting its use in the text to refer to the non-aristotelian system formulated by Korzybski.

Both Mr. Guthrie Janssen (in *ETC.,* V, 70-75, Autumn, 1947) and Dr. Beattie insist that general semantics has 'nothing to do' with semantics, and appear to regard semantics as totally insignificant. As Dr. Beattie says:

> . . . from a careful study of Korzybski's work it becomes obvious that 'semantics' can refer to no more useful a science than could be developed by trying to build up a 'zoology out of unicorns'. . . It would be necessary to explain that it [general semantics] has *nothing* to do with semantics.

The Editors fail to see how anyone from a 'careful study of Korzybski's work' (or anyone else's work, for that matter) could come to the conclusion about the analogy between semantics and unicorn zoology. It would mean complete dismissal of the works of Bertrand Russell, Ogden and Richards, Rudolf Carnap, Charles W. Morris, Pillsbury and Meader, etc., not to speak of scores of other scholars who have not referred to semantics as such,

[3] *Ibid.,* p. 463. All italics in this and the above quotation are ours (Ed.).

but have made useful contributions to the study of symbols, symbolic systems, and the relation between language and behavior (*e.g.*, Trigant Burrow, Thurman Arnold, Jerome Frank, Sigmund Freud). Nor is it apparent that general semantics has 'nothing to do' with semantics. The fact that Korzybski was not familiar with the works of Bréal, Welby, et al., does not warrant any such conclusion. The history of science is full of examples of independent parallel inquiries. Many of the present workers in the field of general semantics derived their first insights into the problems dealt with by Korzybski through the works of Welby, Allen Upward, Ogden and Richards, Carnap, Bridgman, A. F. Bentley, and others. To these workers, general semantics appeared as a powerful *generalization* of their previous, relatively limited systems—a generalization in the sense that their previous studies could achieve an altogether new significance if regarded from this non-elementalistic, psycho-logical 'point of view.' Korzybski himself has applied his psycho-logics in formulating a theory of counting (natural integers) as an example of how psycho-logics could be used in deriving a purely 'formal,' 'logical' structure. Articles in *ETC.* on art, music, literature, sociology, ethics, pedagogy, etc., have been attempts to apply non-elementalistic psycho-logics to new fields.

Mr. Janssen *(loc. cit.)* and Dr. Beattie also insist that hopeless confusion results when the word 'semantics' is used in any context in which the term 'general semantics' is also used. Attention is called to the successive generalizations of the terms 'geometry,' 'algebra,' and 'arithmetic,' which accompanied the development of mathematics. Certainly the modern geometries (projective, differential, non-euclidean, etc.) are vastly more general and powerful than the *Elements* of Euclid, and still more general than the original 'geometry' which dealt with land measurement. Yet the science did not suffer from the fact that the old modest name, 'land measurement,' is still being applied to it. It is a far cry from the old Arabian method of solving linear and quadratic equations to the modern theories of invariants under non-commutative, non-associative transformations which form the subject-matter of modern algebra. Nor is it of any importance that the ordinary connotations of algebra with those unfamiliar with modern mathematics have to do with x's and y's and with people riding bicycles from A to B. Nor does it matter that most people think of the multiplication table in connection with 'arithmetic.' People who work in the field of analytic number theory, one of the most esoteric fields of mathematics, still refer to it fondly as 'arithmetic.'

In the opinion of the Editors, the term 'semantics' will, whatever our individual wishes in the matter may be, in due time be used to include all the disciplines in which symbols *and* the inner reactions to symbols are important objects of study. It will not matter that up to recent times 'semantics' has referred to a much narrower field of inquiry. The popularity of the term (perhaps due to its brevity and euphony) has already rendered impossible the policing of its use. To be sure, a certain confusion necessarily accompanies the spread of a term beyond its strict scholarly seclusion to areas of public discussion. Such confusion is symptomatic of a lively interest in the questions raised by the studies in which the term has been employed. One need not be afraid of permanent, harmful effects resulting from such initial misunderstandings. They are inevitable and should be taken in stride.

A. R., S. I. H.

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WILSON, JOHN T. and Wendell Johnson, 'Extensional Agreement in the Terms "Hypothesis," "Theory," and "Law",' 49.
WINTHROP, HENRY, 'Logos, Telos, and Psyche: *The Semantics of Value Disorder and Personality Disintegration*,' 252.
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From a philosophical point of view it may be of some interest to point out that psychologic processes can occur only where two time lags exist; *i.e.*, the interval between stimulus and response, and the interval between a synchronized tissue need and its alleviation. It has been shown that where there is no interval between stimulus and response there can be no psychologic process. It is equally clear that where there is no interval between a tissue need and its alleviation, the same thing is true. In unicellular organisms the absence of such intervals make impossible any psychologic development; because in such organisms under favorable circumstances all processes of exchange go on continuously at the surface membrane; and only unfavorable circumstances which interpose some barrier to this exchange can cause a delay between tissue requirements and their satisfaction. In differentiated multicellular organisms, however, even under optimal conditions such a delay must always occur; since it takes time to gather in the essential substances from the environment and to distribute them throughout the body; and since it takes additional time to gather up tissue waste, to transport it, and to get rid if it. Thus in the higher organisms structural complexity interposes unavoidable delays which make possible the entire superstructure of psychologic evolution.

LAWRENCE S. KUBIE: Instincts and homœostasis. *Psychosomatic Med.* 10:15, 1948.

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THE MORASS OF MODERN BOURGEOIS PHILOSOPHY

By B. Bykhovsky

An official Soviet view of

Logical Positivism

Semantics

General Semantics